

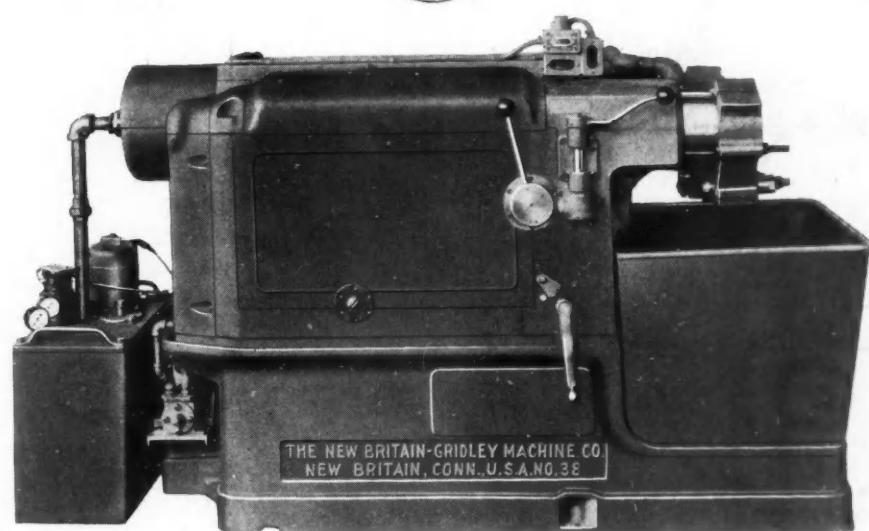
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AUTOMOTIVE INDUSTRIES

Volume 61
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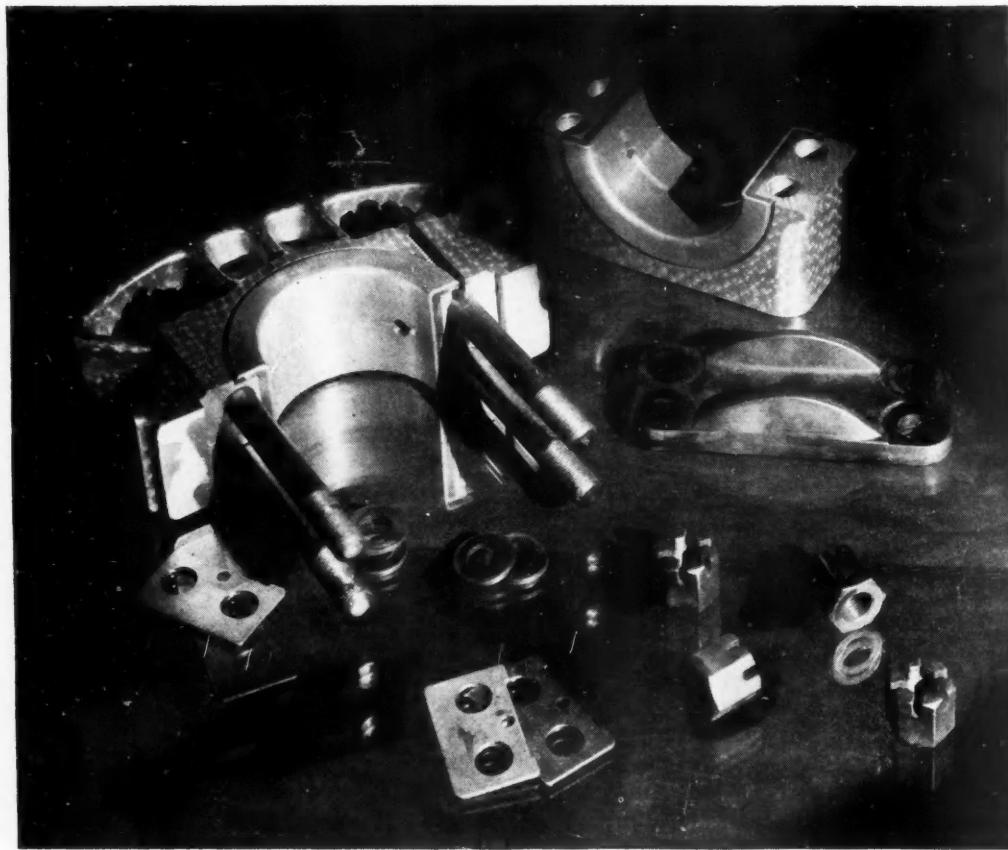


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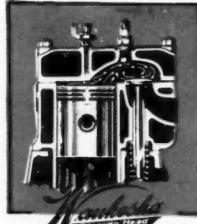
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-- WAUKESHA ENGINES --

Automotive Industries
August 3, 1929

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AUTOMOTIVE INDUSTRIES

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Vol. 61

No. 5

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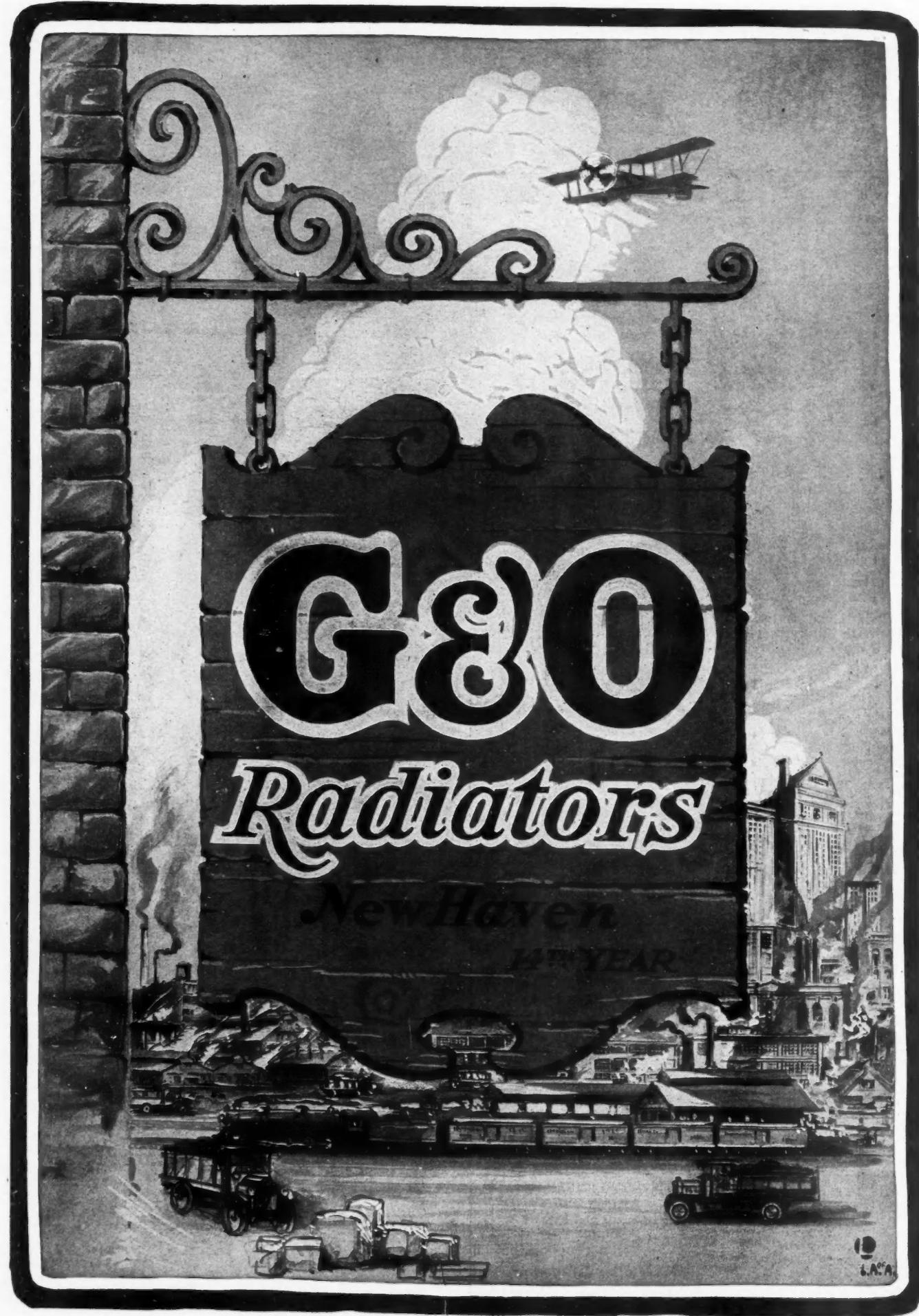
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CHICAGO, ILL.



AUTOMOTIVE INDUSTRIES

VOLUME 61

Philadelphia, Saturday, August 3, 1929

NUMBER 5

Drastic Automotive Legislation Enacted in Last Seven Months

Every state now has a gasoline tax, nineteen of which have been increased. Particular objection is voiced to financial responsibility laws of New York and New Jersey.

By EARL O. EWAN

ABATEMENT of the biennial legislative mania, which this year has affected regular or special sessions of general assemblies in every state excepting Alabama, Kentucky and Virginia, has enabled chroniclers of the law to indicate on the basis of adequate but incomplete compendiums that the inroads of the endemic thus far in 1929 upon the automotive industry probably have been more drastic and severe than ever before.

Staying of the plague has not yet been accomplished fully, for the legislatures of Wisconsin and Georgia still are sitting in regular session, while those of Mississippi and Texas have been sweltering in special convocations. Texas solons have been engaged in their third special session since their regular concourse early this year. Possible symptoms of rerudescence of the affliction practically have disappeared, however, since the coming of the sultry summer days.

Reports to date of the inflictions, sympathetic or otherwise, upon the automotive industry show that they have resulted from the introduction of around 3500 bills in the various legislatures and the consequent enactment of about the same proportion of them as have become measures in previous years of legislative dementia when 2500 bills was the maximum number broached in the automotive category. Particularly reprehensible in the eyes of representative spokesmen for the industry are certain provisions of the financial responsibility laws of New York and New Jersey.

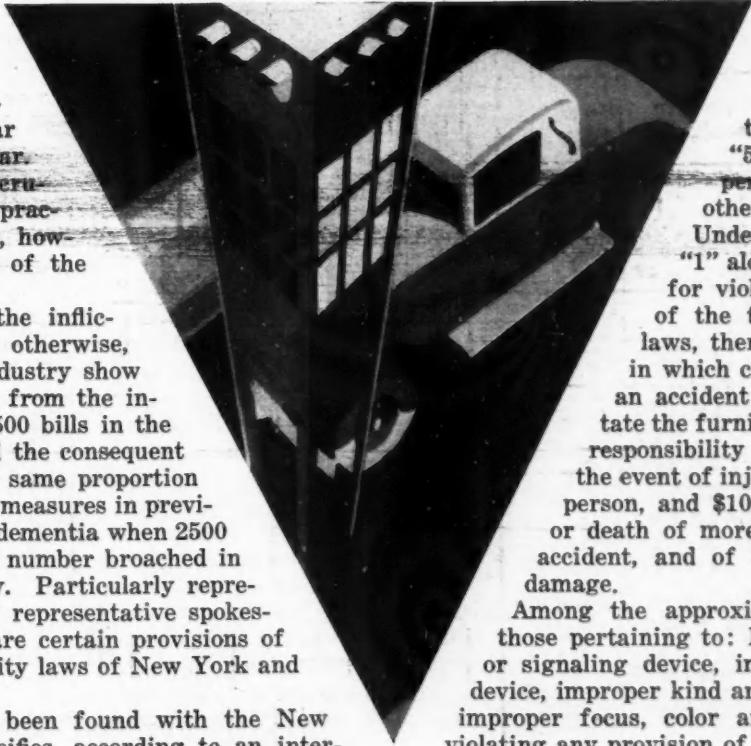
Abundant fault has been found with the New Jersey statute. It specifies, according to an inter-

pretation by the Motor Vehicle Conference Committee, from which most of this information was obtained, that: "The Commissioner of Motor Vehicles may require proof of financial responsibility from any person—

- "1. Who is convicted of violating certain sections of the traffic and motor vehicle laws.
- "2. Who, while operating a motor vehicle is 'concerned' in any motor vehicle accident, resulting in—
 - (a) Personal injury to or death of any person, or
 - (b) Property damage amounting to \$100 or more.
- "3. In whose name such vehicle is registered.
- "4. Both the owner and the person mentioned in '1' and '2.'
- "5. Whose license is suspended or revoked in any other state."

Under the heading of number "1" alone, concerning conviction for violation of certain sections of the traffic and motor vehicle laws, there are about 75 instances in which conviction, whether or not an accident is involved, will necessitate the furnishing of proof of financial responsibility up to \$5,000 available in the event of injury to or death of any one person, and \$10,000 in case of injury to or death of more than one person in one accident, and of \$1,000 for any property damage.

Among the approximately 75 instances are those pertaining to: Improper brakes, no horn or signaling device, improper use of signaling device, improper kind and use of lights, including improper focus, color and use of spotlights, or violating any provision of the light code; no muffler



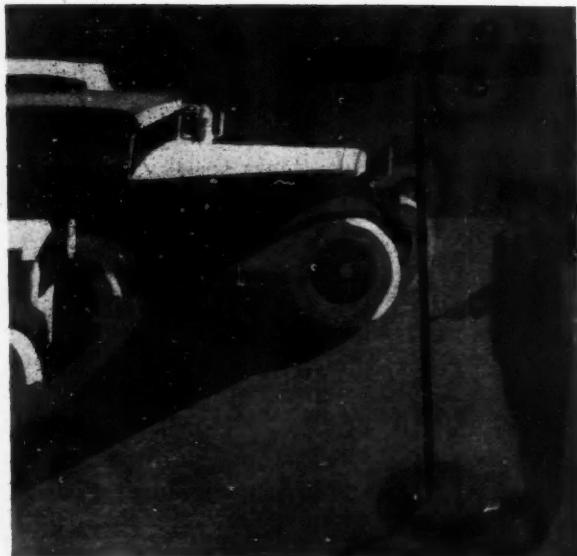
or using "cut-out," exhaust pipes not parallel to the ground or ranging slightly upward, certain vehicles without mirrors, improper use of chains, manufacturer of automobiles failing to obtain proper registration, failure of dealer to properly license, overloading, operating vehicles without rubber tires, except farm tractors; leaving motor running in an unattended car, improperly hitching trailers to towing vehicle, failure to put red light on wrecked car left in highway, improper operation on grades, coasting with gears in neutral, loading or driving a vehicle so loaded as to produce unnecessary noise, permitting people to get on or off moving vehicles, failing to stop when emerging from alleys, driveways or garages, and turning corners in the wrong way.

Liability Increases With Cars Owned

Should a person convicted of one of the offenses named in the New Jersey statute own more than one automobile he would be required to furnish financial responsibility, equal to the aforementioned amounts, on each of his vehicles, and it is possible that a dealer might have to cover, in the event of a conviction, each of the cars in his entire stock. There has been no official or court ruling upon those points, however, since the law does not become effective until next Nov. 15. Nevertheless, the industry has misgivings concerning them.

The New York financial responsibility measure will become effective next Sept. 1. It provides that: "The Commissioner of Motor Vehicles may require proof of financial responsibility from any person for the following reasons," according to the digest of the Motor Vehicle Conference Committee:

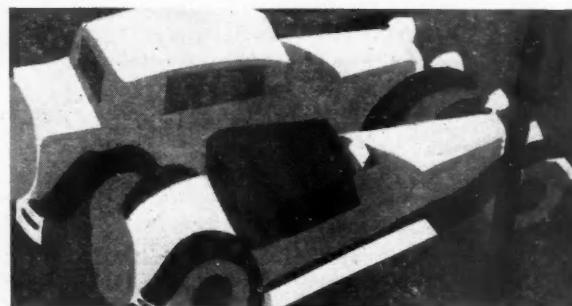
- "1. Conviction of reckless driving where personal injury or property damage has resulted.
- "2. Conviction of driving at an excessive rate of speed where personal injury or property damage has resulted.
- "3. Operating a motor vehicle without an operator's license.
- "4. Operating a motor vehicle while in an intoxicated condition.
- "5. Leaving the scene of an accident without complying with the provisions of the vehicle and traffic laws.
- "6. Committing an offense in any other state which, if committed in this state, would violate the provisions of this law.



- "7. Failure to satisfy a judgment for property damage in excess of \$100, or for personal injury or death resulting from the ownership or operation of a motor vehicle."

Objection in the industry to the New York law was centered particularly upon the seventh condition, since its enforcement, it has been predicted, will make the state a collecting agency for insurance companies. The possibility of an excessive judgment being rendered as a result of an accident for which the defendant was not responsible, and that the defendant could not pay, also has been foreseen as a probable unfortunate circumstance that may arise and deprive the defendant of the privilege of driving an automobile.

Both the New Jersey and New York measures, as well as the California law, which is reported to be very similar to the New York statute, are supposed to have been modeled on the Connecticut decree. It has been in force since Jan. 1, 1926, and has not evoked an unfriendly expression from the industry. The law provides that after conviction of violation of certain provisions of the traffic and motor vehicle codes where an accident has resulted therefrom, a person shall furnish proof of financial responsibility to the amounts



named in the New Jersey law. It requires financial responsibility after the driving record of a person has been proved to be unsatisfactory, but does not demand it for seemingly inconsequential infractions, such as are named in the New Jersey statute, to which the industry is opposed, or for failure to pay what may be an excessive judgment disregarding actual responsibility, as is made necessary by the New York enactment. If a driver does not or cannot comply with the provisions of these canons, he is to be deprived of the privilege of using an automobile within their respective jurisdictions, and perhaps even elsewhere.

Opposed to Compulsory Insurance

The industry, as is known, is unalterably opposed to compulsory liability insurance laws, such as was passed in Massachusetts in 1925 and has been effective in that state since Jan. 1, 1927. No other state has enacted an outright compulsory liability insurance measure.

Forms of the financial responsibility law have been effective in Maine, New Hampshire, Vermont and Rhode Island for less than two years. Rhode Island this year put more "teeth" in its statute by amending it to include more violations upon conviction of which proof of financial responsibility may be required of a person. Maine added a law to suspend the license of a driver until he has paid the amount of a judgment rendered against him as a consequence of a motor vehicle accident which resulted in injury to or death of a person or persons, or damage to property. The law became effective July 13, while a similar one enacted in Iowa

has been in force since July 4.

North Dakota has had in effect since July 1 a form of financial responsibility law that has been the subject of protests both within and outside of the industry. It stipulates that when an operator of a motor vehicle is convicted of reckless driving, driving while under the influence of intoxicating liquor or of narcotic drugs, or leaving the scene of an accident without stopping, that he shall put up a \$2,000 personal or surety bond for a period of two years. This is required upon conviction for any one of the three offenses named and after each succeeding conviction. If within two years after conviction, the convicted

person shall by reason of negligent driving of a motor vehicle cause injury to or the death of any person or damage to property, the statute requires that he shall pay or cause to be paid all claims.

No state has adopted a compensation insurance plan, although it has been considered. Under that plan, a special board, somewhat similar to a workmen's compensation board, would be set up. It would compensate persons injured in automobile accidents at a given rate regardless of who was at fault. To sue for damages, the injured person would have to waive the compensation. The plan would be financed with fees paid at the time motor vehicles were registered. No state has established state fund insurance, which is another conception of liability insurance differing from the compensation plan in that the set amounts paid in by automobile owners would not be disbursed as compensation but to satisfy court judgments rendered in damage suits brought as a result of automobile accidents.

Gasoline Tax in Every State

Every state in the Union now has a tax on gasoline and in 19 states it has been increased this year as a result of the enactment of legislation upon that subject. New York passed its first gasoline levy, imposing a tax of two cents a gallon. A three-cent impost was made effective in Illinois, where the gasoline tax law enacted in 1927 was declared unconstitutional and eliminated in 1928 by the Supreme Court of that state because of a defect in the drafting of the measure.

The maximum gasoline tax levied was imposed in South Carolina and Florida, where 6 cents of the price of every gallon is collected for those states. South Carolina was the first to exceed the 5-cent limit by levying the 6-cent tax, increasing it to that amount from 5 cents. Florida followed by increasing its tax from 5 to 6 cents. Other states which increased their gasoline taxes, and the amounts, were: Colorado, 3 to 4 cents; Indiana, 3 to 4; Maine, 4 to 5; Minnesota, 2 to 3; Montana, 3 to 5; Kansas, 2 to 3; Nebraska, 2 to 4; North Carolina, 4 to 5; North Dakota, 2 to 3; Ohio, 3 to 4; Oklahoma, 3 to 4; Oregon, 3 to 4; Pennsylvania, 3 to 4; Vermont, 3 to 4; Tennessee, 3 to 5; Washington, 2 to 3, and Wyoming, 3 to 4.

The deplorable feature to the industry of the gasoline tax in the instances of Florida, Texas and Georgia is that parts of the sums thus collected go to the school

funds of those states. The industry is not opposed to a reasonable tax on gasoline when the proceeds are devoted entirely to the construction and maintenance of public highways.

There has been no marked tendency to reduce registration fees to compensate for the increases in gasoline taxes. South Dakota passed what has proved to be, both within and outside of the industry, an unpopular registry tax which must be paid in addition to registration fees and gasoline and personal property taxes. It necessitates the payment upon registration of a new car of 3 per cent of its f.o.b. price the first year, 3 per cent of 75 per cent of the f.o.b. price the second year, 3 per cent of 50 per cent of the f.o.b. price the third year, and in subsequent years 3 per cent of 25 per cent of the f.o.b. price.

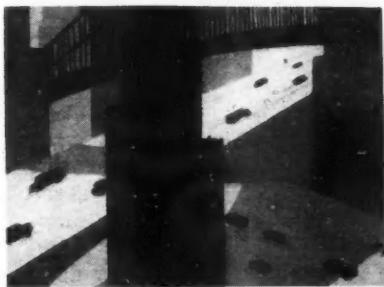
Fees Raised for Solid Tire Trucks

Raising registration fees for solid tire trucks has been one means adopted by legislators to terminate the use on the public highways of vehicles with that type of wheels. Another expedient that is coming into vogue in that connection is prohibiting the use of solid tire vehicles upon the highways. Oregon passed a statute reducing the gross weight that a solid tire truck may carry after Jan. 1, 1930, to 18,000 lb., and prohibiting their use in that state after July 1, 1931, except in the construction or maintenance of highways or for the transportation of county equipment.

Marked favor is being shown six-wheel commercial units by way of increasing the gross weight one of those vehicles may carry. For such a vehicle, Pennsylvania allows a gross weight of 36,000 lb., New Mexico, 26,400; Nevada, 35,000; Delaware, 36,000; Washington, 34,000; Kansas, 34,000; and Idaho, 40,000. Connecticut permits the carrying of 30,000 lb. gross weight on vehicles equipped with pneumatic tires and 26,000 lb. on those having solid tires, and Ohio allows 24,000 lb. gross weight on pneumatic tires and 20,000 lb. on solid tires. Pennsylvania and Washington have included in their laws definite specifications with which all cushion tires used on the highways of those states must comply. Pennsylvania also has in its code new regulations for tractors and trailers with a special section relative to weights and registration and registration fees. There has been a tendency to permit trucks equipped with pneumatic tires to travel faster.

Speed limits now have been eliminated in the open country in Michigan, Kansas and Connecticut. Michigan and Connecticut took the lead, in that order, in 1927. Statutes pertaining to heedless and reckless

(Continued on page 160)



Gardner Offers Six-Cylinder Line With a Total of Twenty-Four

INTRODUCTION of a new series of six-cylinder automobiles, marking a return to a field in which Gardner has not been engaged for approximately two years, and several changes in the two larger series of eights, are announced by the Gardner Motor Car Company of St. Louis. Twenty-four different body styles are offered in the three series.

The new six, which will replace the Model 120 eight-cylinder job, is styled the Series 136 and has a wheelbase of 122 in., its base price being \$1,195. This series includes a Warner Hi-Flex four-speed transmission as standard equipment, while the four-speed transmission is optional on the two larger series.

The former Series 125, restyled the Series 140 in the 1930 line, and the former Series 130, restyled the Series 150, both include numerous refinements in body design and contour, and certain mechanical changes, whereas the prices throughout the smaller series of eights have been reduced an average of approximately \$200, and in the larger series are some \$300 lower.

A Lycoming WS engine powers the six-cylinder series. This is of the L-head type with a bore of 2 $\frac{1}{8}$ in. and a stroke of 4 $\frac{3}{4}$ in.; a piston displacement 185 cu. in.; and 70 b. hp. at 3500 r.p.m. Pistons are of Bohnalite with Invar struts. The engine is rubber-mounted on the frame.

New mechanical features of all three series include Lovejoy shock absorbers, a new windshield control device located at the center of the cowl bar and easily accessible either to the driver or passenger, treadle-type accelerator, rubber-mounted spring shackles, and a starter button on the instrument board.

In addition, the two series of eights have been equipped with double down-draft manifolds and duplex carburetors, thus increasing the brake horsepower in the Series 140 from 85 to 90, and in the Series 150 from 115 to 126. The Lycoming GS engine is continued in the Series 140 and the Lycoming MGD engine in the new Series 150. These engines powered the previous Series 125 and 130.

*Company returns to the manufacture
Flex four-speed transmission as
price of \$1,195. Eights*

Both the Series 140 and the Series 150 have the same wheelbase as their predecessors, but the 122 in. wheelbase of the new Series 136 represents an increase of 2 in. over the corresponding series of eights in the 1929 line.

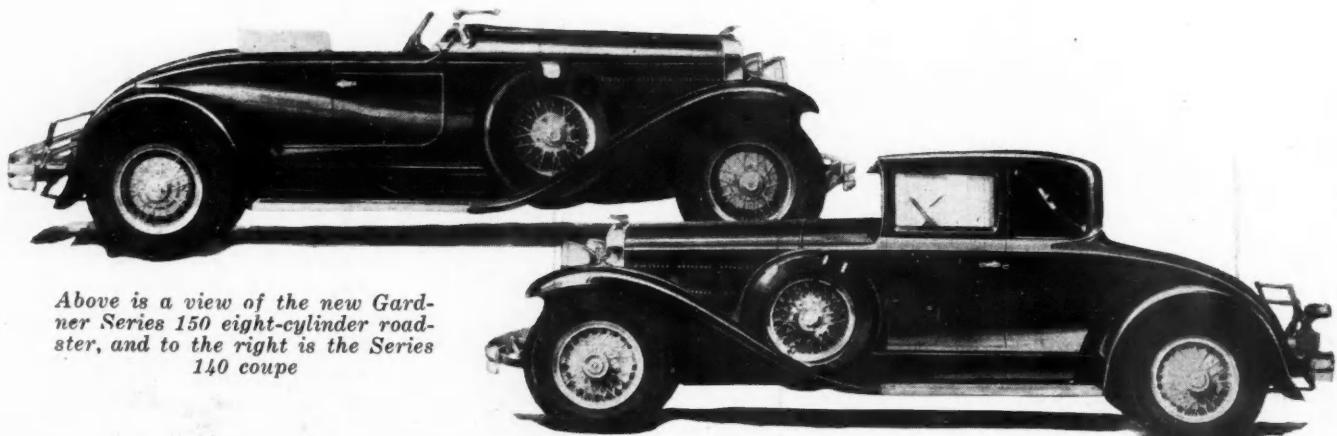
Headlights are of a new design, while a new design of radiator, chrome-plated with black enamel reveals, has been adopted.

A new decorative note is achieved in all three of the 1930 series by the use of a 3 in. molding in lieu of the conventional belt moldings, to contrast the body colors. This molding runs entirely around the new bodies and in a sweeping curve to the center of the cowl where it terminates in a pointed design at the cowl band. This new treatment greatly improves the appearance of the forward part of the car.

The steering gear on all three series is the new Ross open-end construction, semi-reversible cam-and-lever type. Steering wheels are of the hard-rubber, steel-insert, thin-grip type. Cooling systems in all three series are thermostatically controlled, and the water pumps in the two smaller series are belt driven, while in the larger eight the drive is by chain through the accessory shaft.

Oil-type fans, 17 in. in diameter, are supplied in the two smaller series while the larger eight is equipped with a fan one inch larger. Lockheed hydraulic enclosed four-wheel brakes also are standard on all three series. Alemite fittings serve for chassis lubrication. The frame remains of the double-drop design, but now includes front and rear bumper pads. Front brackets are encased.

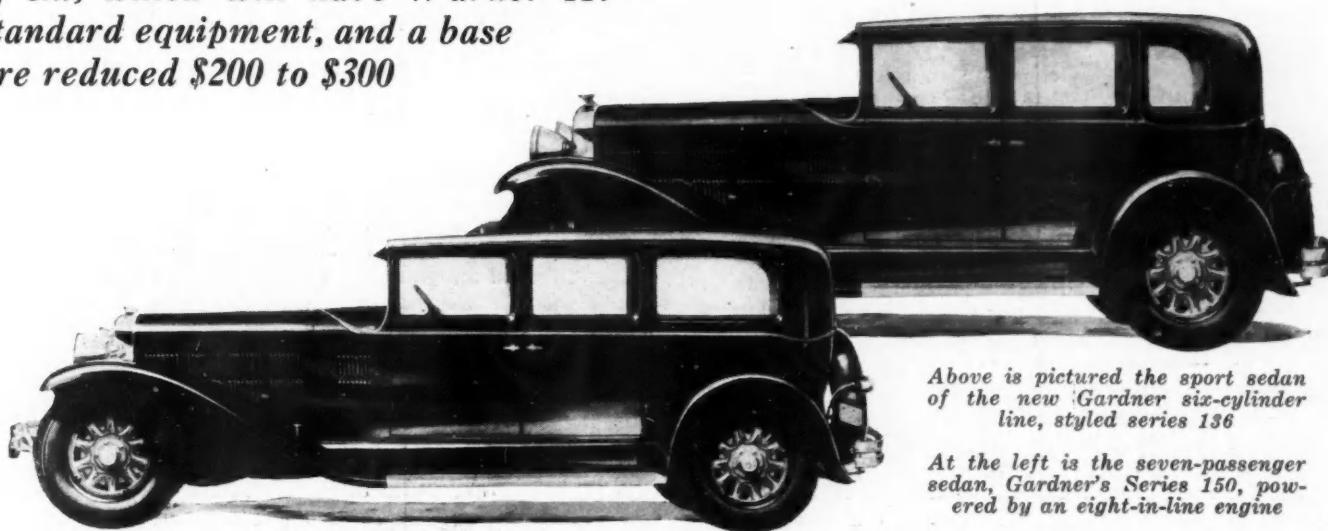
Standard equipment on the Series 136 includes the



Above is a view of the new Gardner Series 150 eight-cylinder roadster, and to the right is the Series 140 coupe

and Two Series of Larger Eights Different Body Styles

of six, which will have Warner Hi-standard equipment, and a base are reduced \$200 to \$300



Above is pictured the sport sedan of the new Gardner six-cylinder line, styled series 136

At the left is the seven-passenger sedan, Gardner's Series 150, powered by an eight-in-line engine

following: Spare rim and tire carrier on rear; nickel head lamp stanchions; automatic stop and tail light; instrument panel indirectly lighted and containing the following: An electric gas gage, an odometer, a speedometer, a heat indicator, an oil gage and an ammeter; adjustable top cowl ventilator; automatic windshield wiper; a vibrator horn with a Gardner-Griffin design mounted in the center of the headlamp tie-rod; rear vision mirror; gas strainer; thermostat; Fedco number plate; ignition lock; non-glare lenses with double filament bulbs in headlamps; side cowl ventilators.

In addition to the above, closed models are equipped with robe rail; exterior sun visor; dome light and rear curtain. Roadsters have full chrome-plated windshield stanchions; side curtains; top boot; detachable top.

De luxe equipment on the Series 136 includes an oil cleaner; full chrome-plated convex bumpers, front and rear; chromium-plated tie bar and stanchions, fender lamps, cowl band and oversize tires.

Interior equipment on the enclosed de luxe jobs includes Chase Sylvatone mohair; Crowell ventilator

windows, ash trays, cigar lighter, electric clock, cowl bar insert, corner lamps, toggle grips, wainscoting paneling; rear quarter curtains, adjustable front seats on 5-passenger sedans, broughams, and sport sedans; rubber pedal pads. A wide variety of paint and trim options are offered.

De luxe equipment on the Series 136 open models includes a number of paint options in green, red or tan, with Art Moderne hand-buffed leather upholstery to harmonize; cigar lighter, electric clock, and pedal pads.

In addition to the extra equipment outlined above, an air cleaner and tools, jack and grease gun are supplied in the Series 140 and 150.

Additional standard equipment in the Series 150 only includes full chromium plating for all exterior fittings; three-way automatic stop signal; and full chrome-plated windshield frame on the roadsters.

Additional interior equipment on the Series 150 includes Sylvatone mohair or broadcloth in all models and adjustable front seats on five-passenger sedan, brougham and sport sedan.

Prices of New Gardner Line

	Series 136	Series 140	Series 150
Chassis	\$995	\$1,395	\$1,745
5-passenger sport sedan	1,195	1,595	1,945
5-passenger brougham	1,245	1,645	1,995
Coupe, with rumble seat	1,245	1,645	1,995
Roadster	1,245	1,645	1,995
5-passenger sport phaeton	1,295	1,695	2,045
5-passenger sedan	1,295	1,695	2,045
7-passenger sport phaeton	1,545	1,945	2,295
7-passenger sedan	1,595	1,995	2,345

Bearing Bronze Research Conducted Suitable Alloy Compositions

*Analysis of service stresses by the Bunting Brass & Bronze Co.
and Metallurgical Division, Bureau of Standards, ex-
pected to reduce total of specifications.*

MUCH of the confusion now existing relative to the most suitable compositions of copper-tin-lead alloys for various classes of service should be eliminated soon as a result of the research on bearing bronzes by the Bunting Brass & Bronze Co. in cooperation with the Metallurgy Division of the Bureau of Standards.

The need for information on the various copper-tin-lead alloys has been evident for years, and is fully appreciated when it is known that at this time there are in use at least 200 different specifications for bronze bearing metals. One of the outstanding examples of the wide difference in opinion as to what is the proper bearing metal for a particular type of installation is shown in the number of different alloys used for wrist pin bushings in the automotive industry.

At present the alloys used in this service vary from the high-tin, low-lead bronzes such as that having the composition of 88 per cent copper, 10 tin and 2 lead to the high-lead, low-tin bearing metal consisting of 75 per cent copper, 5 tin and 20 lead. The use of alloys so widely different in properties in similar installations makes the need for information on the alloys most apparent, for, if it is true that two alloys of radically different compositions give equally good service, wide variations in specifications are not important and all service conditions could be met by one or two alloys. On the other hand, if one of these alloys has superior properties for the service mentioned the user of the other alloy is not obtaining as long a service life as is possible. The situation illustrated by the wrist pin bushings is duplicated in practically

every bearing metal installation in general use.

Realizing this need for further information on the copper-tin-lead alloys as used in automotive service, the Bunting Brass & Bronze Co. decided to give its support to an extensive research program at the Bureau of Standards. The investigation as originally outlined called for a study of a wide range of copper-tin-lead alloys to be supplemented by a study of the effects of the common impurities, zinc, phosphorus, nickel, and antimony, on these alloys. At the time of writing the first phase of this work, the study of the alloys without impurities and the effect of 4 per cent zinc, has been completed and the results published in the *Bureau of Standards Journal of Research*, Vol. 2, June, 1929, No. 6, p. 1017.

The castings from which the test specimens were prepared were of relatively thin sections to give structures and properties comparable with those found in the small bushings so widely used in the automotive industry. Before the work was started a rather extensive survey was made by the Bunting company to ascertain the various kinds and treatments of steel shafts operating in bronze bearings. Generally it was found that a surface-hardened steel was favored. As it was anticipated that difficulty would be encountered in reproducing surface hardness within a narrow range it was decided to use a high carbon steel quenched and drawn to give a hardness comparable with that of surface-hardened shafts.

In outlining the test program, consideration was given mainly to the causes of bearing failures. Bearings are frequently spoken of as "worn out," when, as a matter of fact, wear often



Fig. 3—Equipment Used in the Repeated Pounding Tests

Specimen B, on anvil C, is subjected to repeated blows in compression by the falling weight A. Furnace E, mounted on anvil C, is used for tests at elevated temperatures. D is the driving mechanism and F prevents auxiliary blows from rebound of A. Tests made with a weight of 7.15 lb. falling through a distance of 2 in. .

to End Confusion Concerning

By EDMUND B. NEIL

plays only a minor part in making the bearing unserviceable. Inability to withstand the various service stresses, such as repeated pounding, is the cause of a large percentage of bearing replacements. As a result of a careful survey of the causes of bearing failure the tests decided upon were wear tests, resistance to pounding tests, Izod notch-bar impact tests and hardness tests.

Despite the fact that a great many bearing metal specifications call for a minimum tensile strength, tensile tests were not made in the course of this investigation. Bearing metals are rarely stressed in tension and it was not thought that such tests would yield sufficient information to warrant their cost. A former bearing metal investigation, however, had disclosed no relationship between tensile strength and the more desirable property of resistance to pounding.

In the work reported, wear tests were made both with and without lubricants, but comparisons of the alloys were based wholly on the results of the tests made dry. Lubricated tests undoubtedly have their place in a bearing metal testing routine, but the fact remains that wear only occurs in metal-to-metal contact and that wear tests with a lubricant are likely to be indicative more of the efficiency of the lubricant or the

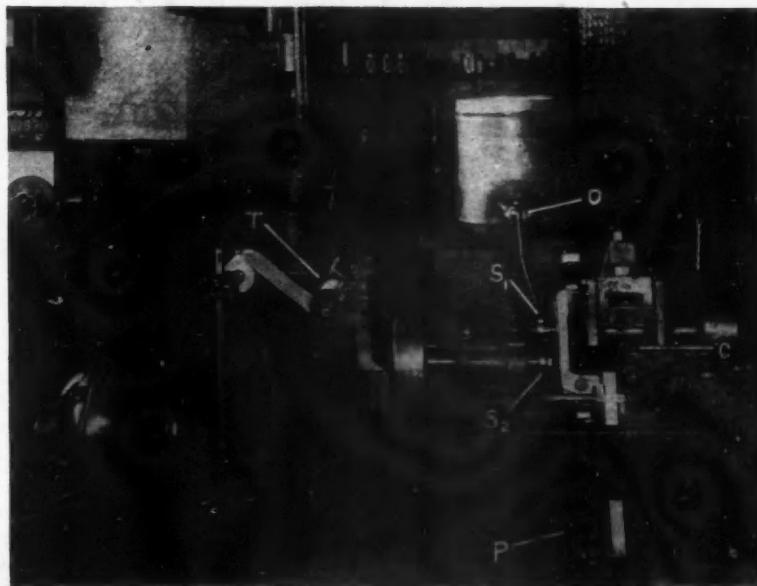


Fig. 1—Amsler Wear Testing Machine
Surfaces of specimens S₁ and S₂ move in the same direction but at different speeds, with lateral oscillation produced by cam C and under contact pressures controlled by spring P. The friction is recorded on the torque indicator T. In tests with lubrication the oil is supplied from reservoir O. In all tests the total load between specimens was 37.5 lb.; the slip, 12 ft. per min.; the amplitude of lateral oscillation, 0.3 in.

condition of the surface of the specimens than of any property of the alloy tested.

All of the wear tests were made on the Amsler wear test machine (Fig. 1). In this machine two flat cylindrical specimens rotate in contact with each other in the same direction with respect to the point of contact but at different speeds. This produces slip between the specimens. The machine is equipped with a torque recording device which gives the friction at any time during the test, and with an integrating friction dynamometer which records the work done in meter-kilograms or foot-pounds during each test.

Two specimens were used in each test, one of steel to represent the shaft material and one of the bronze undergoing examination. Specimens were usually run a total of 40,000 to 60,000 revolutions but were removed and weighed at the end of each 10,000 revolutions. The results of the weight losses obtained are shown graphically in the solid model Fig. 2. In this model, points on the surface represent composition and the height of the model at that point represents the average weight loss per 10,000 revolutions of the test.

It will be noted that an increase in tin or lead reduces the rate of wear; however, no great advantage from the standpoint of decreased wear rates is gained by raising either constituent over about 7 per cent. Aside from the loss in weight of the specimens other information of value is obtained from the wear tests, particularly the friction between the bronze and the steel and the character of the surface of the bronze specimen (whether it is smooth or rough) after test.

It was found that alloys of high tin and low lead showed the highest friction in the tests and that as tin was decreased or lead increased the friction became

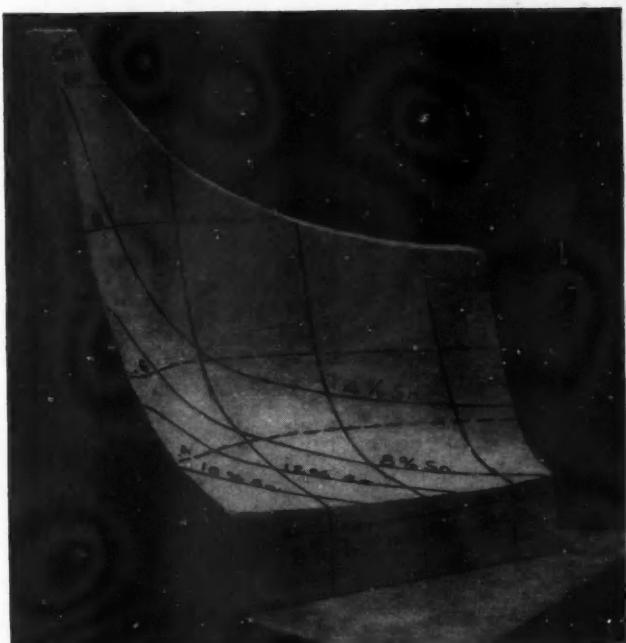


Fig. 2—Wear of Bronzes Tested Without Lubrication
at Atmospheric Temperatures
Wear expressed in weight loss per 10,000 revolutions.



Fig. 4 (Above)—Resistance to Repeated Blows in Compression of Bronzes Tested at Atmospheric Temperatures.

Comparisons are based on the number of blows producing 5 per cent deformation.

Fig. 6—(Right)—Izod Impact Resistance of Bronzes Tested at Atmospheric Temperatures

progressively lower. The character of the worn surfaces was found to line up quite closely with friction. The alloys with high tin and low lead had the highest friction and developed very rough wearing surfaces in the test, while as the tin content was decreased and lead increased the surfaces of the specimens became smoother.

Probably the property next in importance to wear resistance in a bearing metal is resistance to pounding. Bearings are seldom loaded to their capacity when only static loads are considered; for when the loads come near this range, lubrication becomes virtually impossible. The average bearing metal in use today is capable of withstanding static loads of from 10,000 to 15,000 lb. per sq. in. without appreciable deformation.

On the other hand, the pounding action of an unbalanced shaft or eccentric part will often cause serious injury to the bearing in even short running periods. Since few bearings are not subjected to pounding of some sort, a special pounding test machine as shown in Fig. 3 was built for testing the alloys. Specimens one centimeter in diameter and two centimeters in length were subjected to repeated blows of a hammer weighing 7.15 lb. dropping a distance of 2 in. A special device incorporated in the machine caught the hammer after each blow was

struck and prevented secondary blows due to rebound.

In the course of the tests the deformation of the specimens was measured at frequent intervals. The results of the pounding tests are illustrated by the solid model Fig. 4. In this model, points on the surface represent composition. The height of the model at any point shows the number of blows required to produce 5 per cent deformation. From the results given, which are based on the alloys without impurities, the resistance to pounding of copper-tin-lead alloys is largely dependent upon the ratio of tin to copper. An increase in lead with a constant tin content has a beneficial effect on the resistance to pounding, since it raises the ratio of tin to copper. This is most evident in the alloys containing over 6 per cent tin. In the lower tin alloys the weakening effect of the lead seems to balance the beneficial effect of increase in the tin-copper ratio.

Izod (notch-bar) impact tests were made on all of the alloys. The value of the Izod test in judging bearing metals is almost wholly dependent upon the ultimate design of the bearing. Bearings which are completely supported on their outside diameters need not necessarily be tough. On the other hand, if the bearing has overhanging flanges which might be subject to shock, the relative toughness of the alloys becomes of importance.

Part of the equipment used in the Izod tests is shown in Fig. 5. In the test a specimen is clamped in the vise of the machine, the tup released, and the energy in foot-pounds necessary to break the specimen is recorded. Results of the room temperature tests on the pure alloys are shown in Fig. 6. In this model the height represents the number of foot-pounds required to break the specimen. It was found that increase in lead content of the bronzes resulted in a gradual decrease in toughness,



Fig. 6 (Left)—Impact Resistance of Bronzes Tested at Atmospheric Temperatures

Specimen B is subjected to a blow from tup D immediately after removal of equalizing furnace A. The coils, C, permit the vise to be brought to the temperature of furnace A.



increase in tin content up to about 8 per cent had little effect, but increase in tin content over 8 per cent resulted in a marked decrease in toughness.

Brinell hardness tests using a 10 mm. ball and a 500-kg. load were made on all of the alloys. Probably the greatest value of the hardness test in the study of bearing metals lies in the comparison of the hardness of the bearing with that of the shaft. The hardness results obtained, which are shown in Fig. 7, disclosed no relationship between hardness and resistance to pounding. Two alloys of the same hardness may be radically different in resistance to pounding, while on the other hand, alloys of different hardnesses may have the same resistance to pounding.

All of the test results cited were obtained in tests at room temperature on copper-tin-lead alloys without impurities. During the course of the investigation wear tests were made at 350 deg. Fahr., pounding tests at 350 and 600 deg. Fahr., and impact tests at 350 and 600 deg. Fahr. in addition to the tests at room temperature. It was found that relationships disclosed on the basis of room temperature tests held good at the higher temperatures.

The effect of 4 per cent zinc on the range of alloys tested is also discussed in the first report of this work. Generally it was found that 4 per cent zinc had a very small effect on the alloys. An exception was found in alloys low in lead and high in tin, such as the alloy 88 copper, 10 tin, and 2 lead. In this alloy the addition of 4 per cent zinc raised the wear rate considerably.

In summarizing the results of this investigation the alloys were divided into groups for different conditions of service.

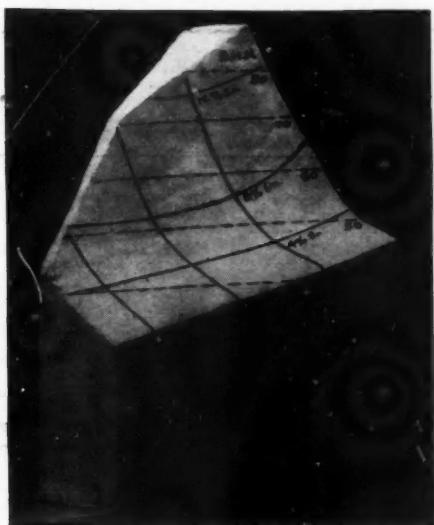


Fig. 7—Approximate Brinell hardness Values for Part of the System Copper-Tin-Lead. Based on tests with a 10-mm. ball and a 500-kg. load

able strength characteristics for most installations can be obtained together with good wear and frictional properties.

Since the publication of the first phase of the work which deals with the pure alloys and the effect of 4 per cent of zinc much progress has been made in the study of the effects of other impurities. The results of these tests, which will be made public as soon as completed, are expected to bring into general application much better bearing metals than are in use today.

At the present time plans for an extensive white metal bearing investigation have been completed and work has been started. In this new project the Bunting Brass & Bronze Co., the War Department, and the National Lead Co. are cooperating with the Bureau of Standards.

It is expected to correlate laboratory and service tests in this new investigation.

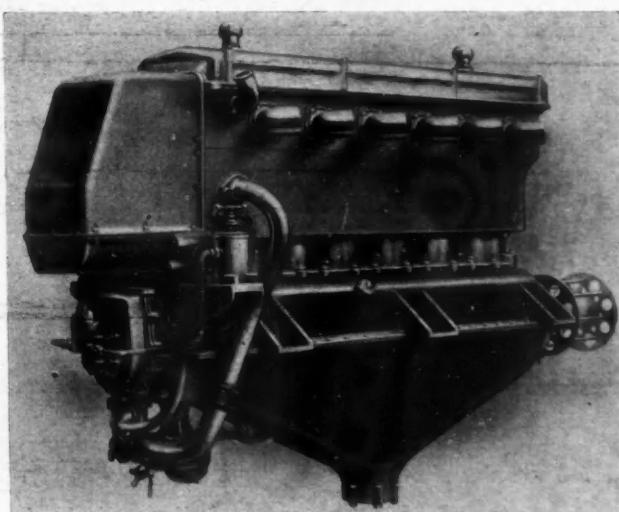
Sunbeam Diesel Type Engine

A HIGH-SPEED compression-ignition engine has been developed by the Sunbeam Motor Co., Wolverhampton, England, primarily for aircraft but capable of being adapted for use in trucks. A sample was shown at the Aero Exhibition held in London in July.

As seen in the accompanying photograph, it resembles a gasoline engine in appearance, apart from the casing enclosing the fuel pump, etc. The success of the experimental engine, it is stated, is largely due to the efficiency of the fuel valve design; it is described as "mechanically operated, with most exact timing and permits high engine speeds to be attained with equal division of work among the cylinders."

It will be known as the Sunbeam-Coatalen Compression-ignition engine Type P1. It is claimed to be similar in size and weight to the average gasoline engine for corresponding purposes. The bore and stroke of the six cylinders are 120 mm. and 130 mm. respectively (approximately $4\frac{3}{4} \times 5\frac{1}{4}$ in.), the piston displacement therefore being 538 cu. in. It develops 100 b.h.p. at 1500 r.p.m. Fuel consumption with heavy oil is given as .4 pt. per b.h.p.-hr. and the lubricating oil consumption as .03 pt. per b.h.p.-hr.

Only a very small excess of air is required in the cylinders, and the engine is smokeless and free from smell; it can be started from cold without auxiliary apparatus.



The Sunbeam-Coatalen compression-ignition engine

Today's Freak Racing Cars Easily Rickenbacker Replies to Moskovics'

Change in Indianapolis contest regulations was needed because no further engineering data was obtainable from competition between 91 in. jobs, he says.

IT'S superfluous, of course, to say that every man has a right to his own opinion. Mr. Moskovics took advantage of that right in claiming that the new rules for the 1930 Indianapolis race

would result in the birth of a veritable army of automotive freaks. I could say "All right, what of it?" and point to the four-cylinder engine, the six-cylinder engine, the eight-cylinder engine, front-wheel drive, and four-wheel brakes, each of which was at one time considered a "freak," but is now in production. For that matter, the first automobile developed was considered a freak of the first water.

I merely wish, at the outset, to emphasize the point that today's freak easily can become tomorrow's standard. So that even if so-called freaks were to tear around the Indianapolis track in the 1930 race it would be no indication that they would not contribute something to automotive engineering. And so far as winning the race no one dare assert with certitude that the freak has a decided edge on its—shall we say normal?—competitors. Anything can happen on a race track. In fact, to recall two instances, Souder and Myer each won first place at Indianapolis with old, second-hand cars.

When front-wheel drives were still in the freak class it was generally agreed that they were ideal for conditions to be encountered on the Indianapolis track. And yet, has one of them won the race?

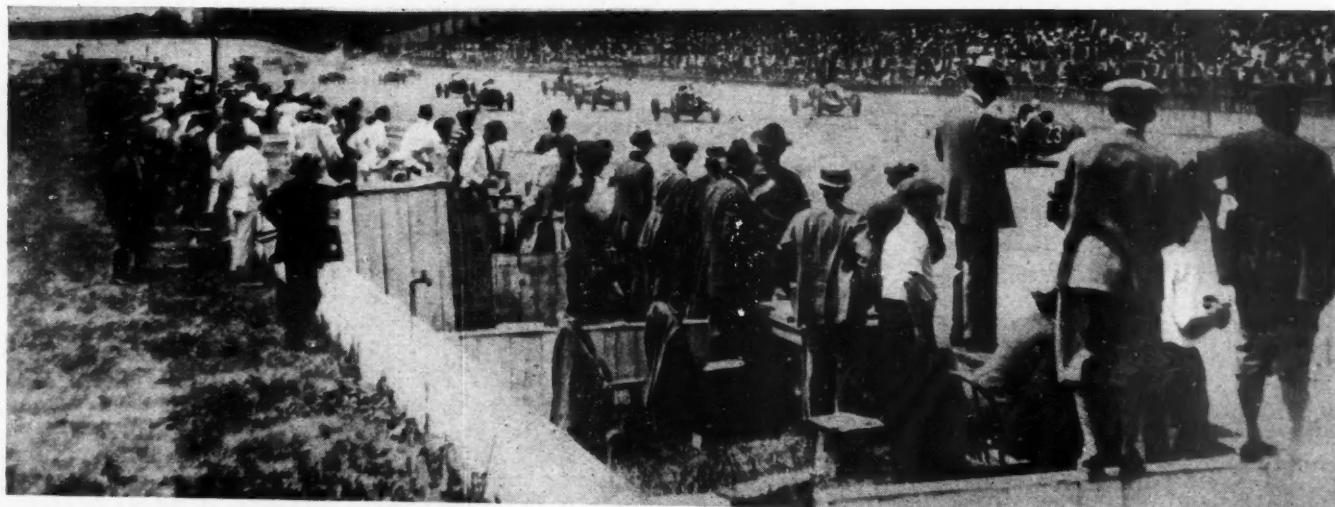
So sure am I that a racing freak such as Mr. Moskovics describes is not the best entry to make under

the 1930 rules that I will make Mr. Moskovics a personal wager that the car which he describes and which he says is being built for next year's race will not even finish.

Therefore, to the charges made, one might readily reply "what of it?" and expect an embarrassed silence to ensue. This might be construed an evasive retort, so to dispel the likelihood of any such construction, let's take up Mr. Moskovics' contentions point by point.

It seems altogether illogical to suppose that any individual or syndicate will finance the building of two racing freaks at a cost of \$150,000, as suggested by Mr. Moskovics. The cost of such an enterprise is out of all proportion to the possible winning—even first place money. Any driver who is able to get such financial backing should be congratulated as a promoter rather than a driver. In this connection, Mr. Moskovics points out what he considers to be a loophole in the rules. Certainly no man is quite so well qualified to take advantage of racing rules as he, and we shall be very glad to welcome him as promoter of a team of specialized racing cars at Indianapolis next year.

He objects to provision in the 1930 rules which keeps out superchargers and more than two valves per cylinder on four-cycle engines. He calls attention to the fact that superchargers are permitted under European racing rules. Our idea in eliminating superchargers and more than two valves per cylinder in four-cycle engines is that we went as far in that



Approaching the first turn on the Indianapolis track

Can Become Tomorrow's Standard, Criticism of Rules

By CAPTAIN E. V. RICKENBACKER
President, Indianapolis Motor Speedway

as told to
JAMES W. COTTRELL

direction with the 91-in. jobs as practical. In fact, further development of engines of small displacement with very high power output is contrary to the trend of passenger car design.

Blowers have been used for the past seven or eight years, but no large production maker has yet adopted them. The racing type supercharger running up to 30,000 r.p.m. is not practicable for every-day use. On stock cars such a mechanism is impossible on a cost or maintenance basis.

There is a demand for more power in stock cars, and it becomes a question of engineering judgment which is better from the user's standpoint, more piston displacement, or a blower. We went to the extreme in finding out what small displacement and blower could do. Now we turn about and shall find out what more piston displacement will do. The same reasoning applies to the number of valves per cylinder. Three and four valves a cylinder can be used, but the fact remains that production cars in this country have two valves per cylinder.

A supercharged four-valve job is too highly specialized for every-day use. Mr. Moskovics cautioned against too much specialization, but advocates complication in present stock car design.

The idea that we are going to make a Roman holiday of the Indianapolis race next year is ridiculous. We look upon it as a constructive sporting event which serves as a laboratory for the industry while at the same time drawing the largest crowd of any similar event. The rule requiring two men in each car is adopted with the idea of helping the driver. He has all he can do to watch to the front of the car, and the mechanic acts as "eyes" in the rear. More than one crash has happened because a driver leading into a

IN the accompanying article, E. V. Rickenbacker, president of the Indianapolis Motor Speedway, answers the criticism of the 1930 Indianapolis race rules expressed by Frederick E. Moskovics in an article published last week in AUTOMOTIVE INDUSTRIES. The latter stated that the new rules for the 500-mile contest would develop "freak" racing cars, with multi-cylinder engines, streamlined to the last degree and costing large sums of money. Mr. Moskovics holds the opinion that entries to the race should be confined to "modified" stock cars, and that the rules should place limits on fuel and oil capacity, similar to those imposed abroad. Such regulations, Mr. Moskovics maintains, would make the race of greater benefit to the industry as a whole, and ultimately to the general automobile user. They would remove the classic, he contends, from the category of a highly specialized speed spectacle.



Captain E. V. Rickenbacker who knows motor racing as:
Mechanic, racing driver,
spectator, A.A.A. official,
and track owner

turn did not know what was taking place a few feet in the rear.

Another reason for carrying two men in the car is to furnish a post-graduate course of schooling for drivers. There is now no training ground for the board speedway. Ten years ago a fellow had a chance to train on dirt tracks and he became acquainted with the problems to be met in high-speed work. But there is no precedent to guide him on wide-open work on

board tracks and he suffers because he does not know the "feel" of speed.

If some Solomon could be found to get the public and automobile manufacturers to agree on what is a stock car it might be possible to arrange a stock car race. But the fact is that we have been trying for about twenty-five years to find the difference between a stock car and a special job. Mr. Moskovics suggests some modifications in stock cars; others would suggest other modifications, and there would be no common middle ground between a car just off some factory assembly line and an out-and-out racing job.

There is no advantage in testing electric starters on the race track. Starters are out of place on race cars,

RICKENBACKER DEFENDS RACE RULES

*Automotive Industries
August 3, 1929*



Captain Rickenbacker and Harvey S. Firestone, president, Firestone Tire & Rubber Co., photographed at the Indianapolis track before the race on last Memorial Day

and these units have been tested and perfected in ordinary service. Gas lines and ignition wiring and other minor parts, which Mr. Moskovics mentioned, can be tested in laboratories to better advantage than on the tracks. A limit on weight of fuel and oil is out of line with present-day automotive developments in this country. Fuel limits have been used in Europe, but conditions there are different than in the United States. In Europe, fuel is expensive; here it is cheap. In order to get power we must burn gasoline, and it takes more power to go fast. As a matter of fact, the 91-in. jobs used more gas per mile than the cars under the original 600 cu. in. limit.

I have already commented upon the supercharger rules and shall not repeat it at this time.

Restricting fuel used in the car to that available at any gas station surely would throttle future developments of both fuel and engine. Where would we be

today without high-compression engines, made possible by anti-knock fuel, which was not "buyable" a few years ago? We should put nothing in the way of development along these lines.

There will be plenty of cars costing less than \$5,000 entered at Indianapolis next year and, while they may be competing with a few very expensive special jobs, they will have an excellent chance to win. It was not long ago that a car, purchased second-hand for less than \$5,000, won a race at Indianapolis.

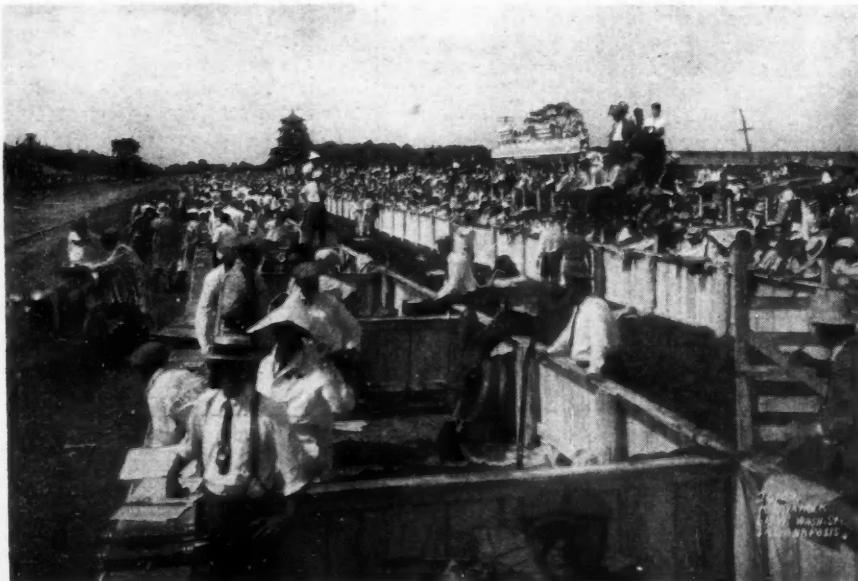
Now that we have taken up each of Mr. Moskovics' points in turn, it is in order to explain some of the background of the new rules. Indianapolis Speedway is the daddy of all motor racing, and as such, has an obligation to the motoring fraternity. As president of Indianapolis Speedway, I feel it my duty to carry forward that obligation.

Experience last year and this year indicated that no further engineering information of value to designers of stock cars could be obtained from further competition between the highly specialized 91-in. jobs, except some further advance in metallurgy. Some change was in order. In fact, rules have been changed every three years for some time. The 91-in. jobs had an additional year.



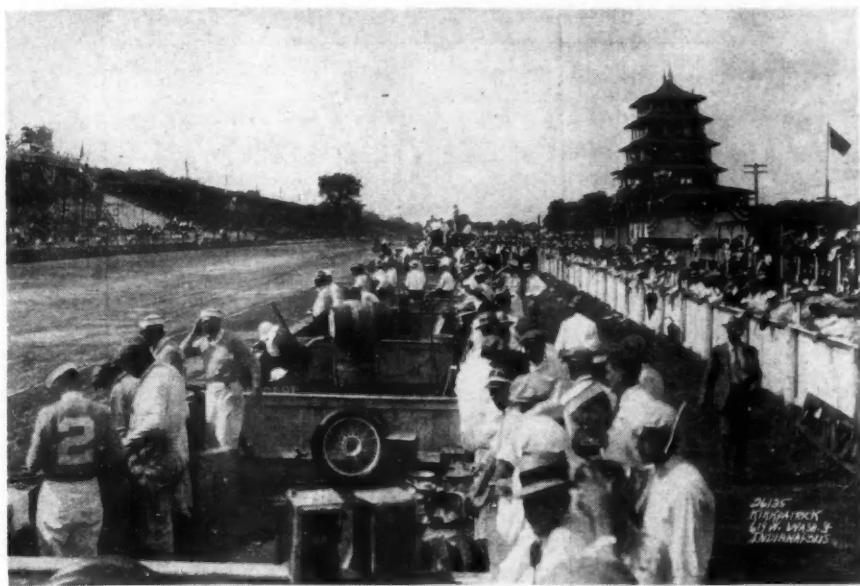
Above is a view of the home stretch at the Indianapolis Speedway, with a small part of the thousands of automobiles in the parking area

To the left is a view of the pits at the Indianapolis race last May. One of the cars being serviced may be seen at the extreme left of the picture



In considering the general line of procedure one fact stood out. It was that, contrary to expectations a few years ago, passenger car development in this country was not toward smaller cars, more economical to run, but toward larger and more comfortable cars.

This is the age of speed. Speed in the air has directed attention to more speedy transportation of all forms. The cycle of better roads and



At the left is another view of the service pits at the Indianapolis Speedway taken during the races held on May 30, 1929

race next year will attract the largest entry of foreign cars in the history of the Indianapolis Speedway, entries, let me say, from makers who have been successful in racing under the so-called Le Mans rules.

Certainly there will be cars at Indianapolis next year which will be different from stock production models, but we are sure that the general development will be along the lines of principles that can be adopted in production. If a few build experimentally, the majority will benefit. There is a penalty and a reward for advancement, and we must pay for progress.

In adopting the rules for 1930 we had a six-fold objective:

1. Service to the automobile buying public.
2. To reduce the initial cost of racing cars to the racing driver.
3. To reduce the cost of maintaining the racing car.
4. To supply manufacturers with information of use to them in designing production cars and to get the manufacturers' support for a race giving them this information.
5. To create a competitive event in which the public will be interested because of a variety of designs other than two basic schools of design as in the last few years.
6. Add safety to drivers and help the education of drivers and mechanics.

There will be twice as many entries for the 1930 race as this year, according to all present indications. I am sure that the 1930 race itself and the lessons learned from it will demonstrate the soundness of the conclusions of those who helped us draw up the new rules and our judgment in adopting them.



The above photograph shows one of the largest German trucks ever built. It has a capacity of 20 cu. yds. The chassis is a six-cylinder Daimler-Benz and the body is of the Kuka type

Just Among Ourselves

Needed Production Research Hindered by Time Limits

EVERY time we spend a few hours out along the production lines of some automobile or parts factory, we are further impressed by the multitude of small, yet vital, manufacturing problems which still remain facing production men or which just recently have been licked. We are impressed, too, with the difficulties in the way of the average production man who would know whether or not his particular problem has already been met and solved some place else.

This is partly due to the fact that the available mediums of exchange of such ideas are far from being perfect in their functioning. Neither the business publication such as *Automotive Industries* nor the professional society such as the S.A.E. has come close enough as yet to its possible ideal service in this regard.

Time, moreover, is perhaps the greatest hindrance in the way of the average production man who would like to save himself trouble by checking his particular problems against past experience in other plants. Usually there is no time for research, investigation or correlation of available data. The line is stopped; it must be started; minutes actually mean dollars.

* * *

Production Men Need Ideas as Well as Designers

IT has seemed to us, in this connection, that production men are less prone than designers and experimental engineers to scan constantly those business publications which might be of assistance, to keep files of ideas for possible quick future use, or to have organized, even informally, an idea file which might furnish on occasion a lead to the answer of

some practical problem entirely unexpected at the time the idea was dropped into the file.

Many design and experimental engineers, we believe, keep and have found useful such files, sometimes very informal, sometimes rather elaborate. Certainly in the average plant the design engineer usually seems to have a wider knowledge of the small, new ideas developed or being developed by his competitors than does the average production man, even though their knowledge of common practice among competitors or throughout the industry be quite equal.

* * *

Personnel Relationships No Field for Outsiders

THE automobile business unquestionably is getting more attention from various types of labor organizers and agitators than at any time since the war and the immediate post-war period. Much literature of various kinds, some of it in books, some in generally circulated magazines and much of it in small leaflets, has been making its appearance in recent months. A few actual departmental strikes have occurred, some of them resulting in definite physical conflicts.

When conditions of this kind arise there is usually a tendency for excitement and irritation to increase in geometrical ratio to the virulence of the disturbances; this natural human tendency is to be considered when attempting to estimate the seriousness of events. Tendencies usually develop also on the part of some manufacturers to seek panaceas, outside help in personnel relationships and various other methods of "doing something" for the sake of activity, if for no other reason.

Whatever the developments, it seems worth while emphasiz-

ing at this time that practical experience in many industries in past years has indicated clearly the impossibility of shifting the effort, work or operation of personnel relationships to any outside agencies. The factory which is unable to maintain harmony through the intelligence, stability and operating capacities of its own executives rarely, if ever, has been able to solve its problems through shifting them to outside "experts." The problem of industrial relations in any factory probably always will remain one inherently individual to the management of the individual plant.

* * *

Tool Designers' Interest Vital to Material Handling

WHAT has a tool designer got to do with material handling? He should have plenty, says a veteran production manager to whom we talked the other day, but usually he doesn't. "Trouble with most tool designers," says this vet, "is that they follow precedent almost automatically. They don't seem able usually to discover the problems connected with a job and then to figure out ways of solving them. Even the recognition of the existence of a problem would be something."

This production manager had a lot of other things to say about what he thought about tool designers, but we'll save the rest for a more appropriate place. The point we wanted to make here was that apparently tool designers will just have to be added to the long list of men in every department in every factory who have this same fault. We've heard the same sort of complaint from executives in nearly every other branch of the business as well. Guess, unfortunately, it's a too common human failing.—N.G.S.

Dodge Adds Four-Cylinder Truck to Line, Priced at \$745

New unit has 133 in. wheelbase, four-speed transmission and four-wheel hydraulic brakes. Powerplant is similar in some respects to Plymouth engine.

ANNOUNCEMENT has been made by Dodge Brothers of the addition of the lowest priced 1-ton truck in its history. Priced at \$250 less than the last 1-ton, six-cylinder model, the new unit, with a four-cylinder powerplant, four-speed transmission, four-wheel hydraulic brakes and 133-in. wheelbase with 8 ft. bodies, lists at \$745 for the chassis.

The new truck is offered in seven body styles, a panel delivery, canopy express, screen type, regular express, stake body, platform type and a body designed particularly for farm use. At the same time, the wheelbase of the six-cylinder unit is increased to 133 in., and the price reduced \$150, to \$845.

Complete prices of the four-cylinder model are as follows:

Chassis only	\$745	Express	\$1,007.50
Chassis and cab	890	Canopy express	1,032.50
Platform body	955	Panel delivery	1,057.50
Farm	985	Screen express	1,057.50
Stake	1,000		

Prices for the new 133-in. wheelbase six-cylinder model are exactly \$100 higher than the above in every case.

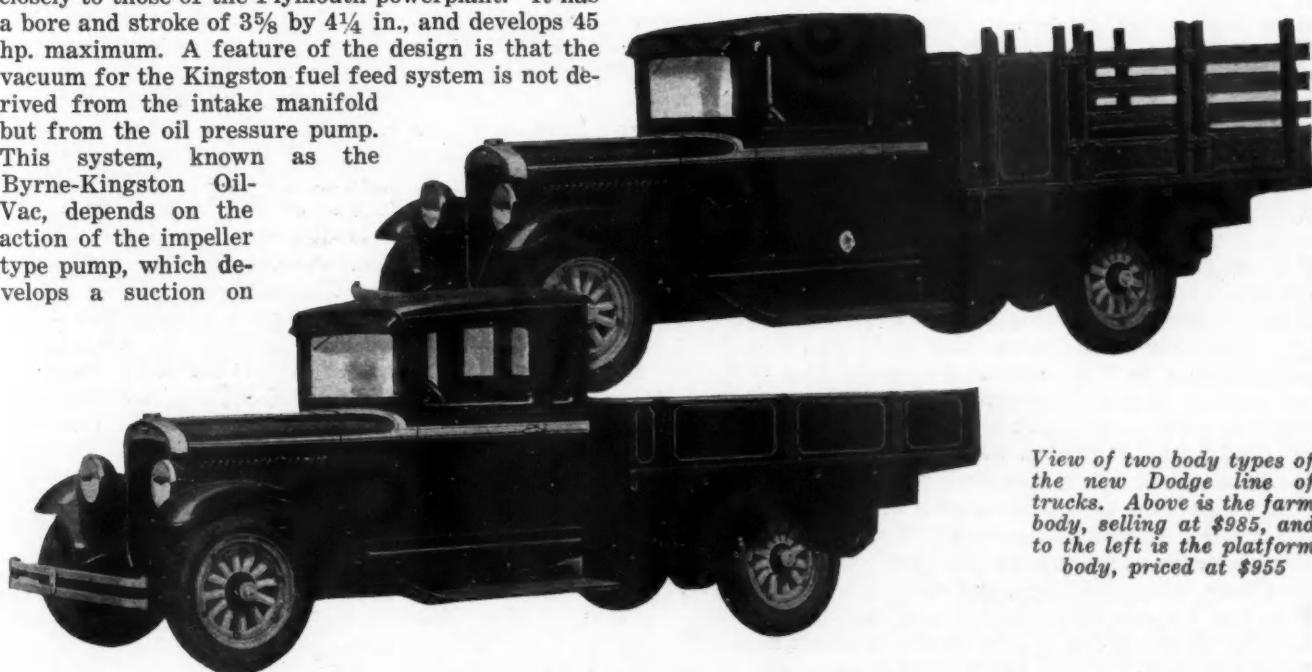
Specifications of the four-cylinder engine correspond closely to those of the Plymouth powerplant. It has a bore and stroke of $3\frac{5}{8}$ by $4\frac{1}{4}$ in., and develops 45 hp. maximum. A feature of the design is that the vacuum for the Kingston fuel feed system is not derived from the intake manifold but from the oil pressure pump. This system, known as the Byrne-Kingston Oil-Vac, depends on the action of the impeller type pump, which develops a suction on

one side and a pressure on the other. By tapping in the vacuum tank connection at the suction side, an operation is obtained which is more nearly relative to engine speed than the usual manifold vacuum type of operation, since the suction is dependent on the speed of the pump.

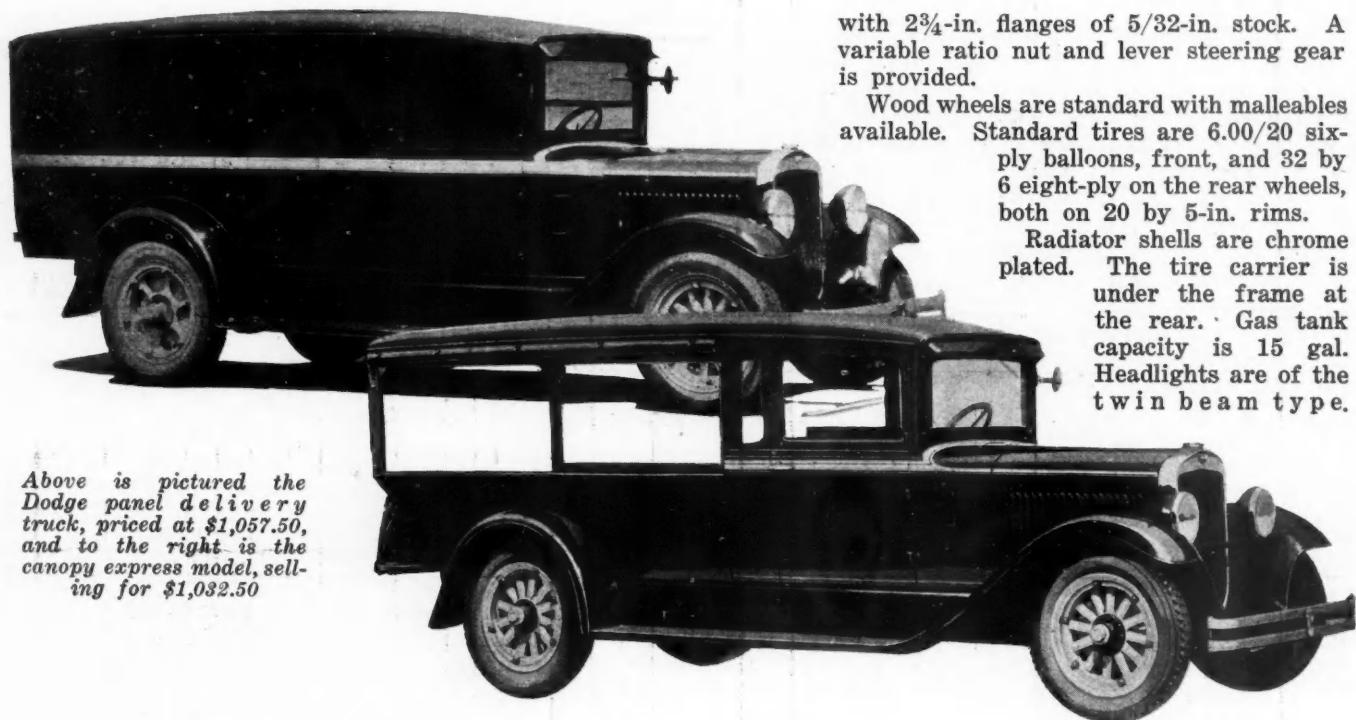
Other engine design features include aluminum alloy invar strut type pistons, rubber engine mounting, pressure lubrication to main, crankpin and camshaft bearings, pump type cooling system, two-unit electrical system, air cleaner, crankcase ventilation and water circulation control thermostat.

The transmission is of the standard spur gear, four-speed type, with ratios of 1.73 to 1 in third, 3.52 to 1 in second and 6.56 to 1 in low. Fourth speed is direct. With the standard rear axle reduction of 5.6 to 1, this gives an overall low speed reduction of 36.7 to 1. Optional ratios for the rear axle, of 5.1 and 6.75 to 1 are also available. The transmission is mounted in unit with the engine.

The rear axle unit is a semi-floating type and heavier than usual. Four-wheel brakes are made up of 14-in. drums on the front and 15-in. drums on the rear wheels, hydraulically operated, and expanding. Width of lining is $1\frac{3}{4}$ in. for the front and 2 in. for the rear. A hand-operated brake with 2-in. width, 8-in. diameter drum



View of two body types of the new Dodge line of trucks. Above is the farm body, selling at \$985, and to the left is the platform body, priced at \$955



Above is pictured the Dodge panel delivery truck, priced at \$1,057.50, and to the right is the canopy express model, selling for \$1,032.50

on the propeller shaft supplements the service brakes.

Propeller shafts are of the two-piece type, with three ball-and-pin type universals, with a flexibly mounted ball bearing providing a self-aligning support for the center of the propeller shaft. Front axles are normal I-beams type, with roller bearings at the steering pivots. Springs are semi-elliptic all around, 39 by 2 in. at the front, and 48 by 2½ in. at the rear.

Frames have a double kick-up resulting in a low-loading height, five cross members, and 6-in. deep channels

Standard equipment includes combination stop and tail light, engine governor set for 40 m.p.h., air cleaner, thermostat, locking ignition switch.

The new six, in addition to the longer wheelbase, also has the same chassis features as the new four, with a heavier axle, double kick-up frame with five cross members and lower loading height, etc. The engine continues materially unchanged over that of the previous series. The 140-in. wheelbase 1-ton six-cylinder model is also continued.

Drastic Automotive Legislation Enacted

(Continued from page 147)

driving have taken the place of speed limit laws in those states. Where speed limits have been retained in the open country, they generally have been raised to 40 or 45 miles an hour.

Of particular concern to the manufacturers is the law passed by Arkansas, requiring every maker of motor vehicles who sells them in that state to pay a sales tax of \$500 a year. The measure already is being contested by one automobile manufacturer. It follows the lines of a similar enactment that was on the books of North Carolina until a few years ago, when it was repealed.

Comparatively few statutes were passed to increase safety on the highways. Minor changes were made in many instances to increase the penalties for certain transgressions committed on the road. No noteworthy statutes were enacted though, for instance, to prohibit reckless driving. There were numerous instances where precautionary laws were passed, such as those requiring vehicles to stop when they come upon a bus taking on or unloading school children, and that school buses shall stop before crossing railroad tracks. No outstanding legislation was written, however, for the elimination of grade crossings. Maryland, Massachusetts and Pennsylvania passed laws authorizing their state commissioners of motor vehicles to designate periods for the inspection of lights, brakes and steering mechanisms. Nebraska and Indiana enacted meas-

ures making drivers' licenses necessary.

Closely associated with the subject of safety legislation is the question of liability of the automobile driver for injuries suffered accidentally by non-paying passengers. None of the so-called "thumb-jerker" bills to make hitch-hiking a misdemeanor was passed.

Parts of the Hoover Code were enacted in New Mexico and Nevada. In the former state, the measures passed were "A Uniform Motor Vehicle Registration Act" and "A Uniform Act Regulating the Operation of Vehicles on Highways." Nevada wove into its legal fabric "A Uniform Motor Vehicle Registration Act." Among states that already had adopted the advanced rules of the road based on the Uniform Code, or had revised their laws to gain closer uniformity therewith, were: Pennsylvania, New Jersey, Virginia, North Carolina, North Dakota, Idaho, Michigan, Minnesota, Arkansas, Louisiana, Oregon, Washington, New Hampshire, California and Oregon, according to the National Conference on Street and Highway Safety.

Further report and analysis of the scope and nature of the measures molded from the 3500 bills, exclusive of those dealing solely with highway construction and maintenance, by the legislators of 45 of the 48 states in regular and special sessions this year must await a more extensive sorting and compiling of this maze of legislation directed toward the interests of the world's greatest manufacturing industry.

Norton Semi-Automatic Grinder Used For Finishing Bearing Surfaces

Application of machine tools in production of parts follows the trend of the industry toward greater volume output with a reduction in cost

In the application of grinding machines in production shops the tendency has been constantly toward greater production and reduced cost, the same as in the use of machine tools of other types. An example of this tendency is seen in the use of the Norton semi-automatic machine in grinding the mounting surfaces for the anti-friction bearings of stem pinions (or rear-axle-drive bevel pinions formed integral with their shafts). The part is clearly shown in Fig. 2, which shows the two mounting surfaces that are ground in one operation. It is made of nickel steel and heat-treated. From 0.016 to 0.017 in. stock is removed in roughing, and from 0.001 to 0.0015 in. in finishing. The tolerances on these two surfaces are only 0.0005 in.

The machine used is a Norton Type B semi-automatic grinding machine, complete with spindle-reciprocating and shoulder-locating attachment, special truing device for truing the two wheels simultaneously, and a special vee for placing the work on centers. The wheels used

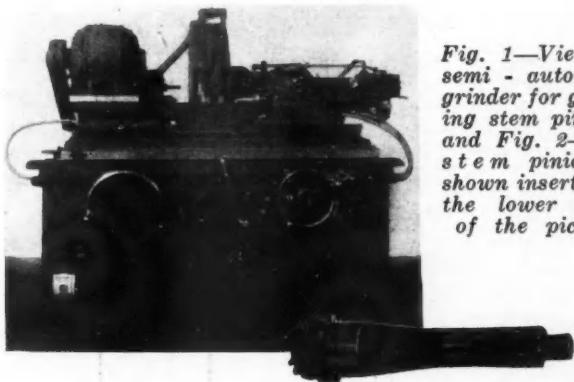
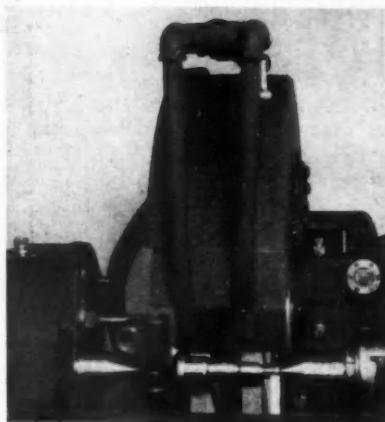


Fig. 1—View of semi-automatic grinder for grinding stem pinions, and Fig. 2—The stem pinion is shown inserted at the lower right of the picture

are 1924 combination M, in the proper widths for the surfaces to be ground. One wheel is slightly smaller in diameter than the other to compensate for the difference in the diameters of the piece. The work is revolved at 75 to 125 r.p.m. and the wheel at 1200 r.p.m. The production is 120-130 pieces per hour, with a good commercial finish.

Another job which can be done to advantage in the same machine is the grinding of the bearing mounting surfaces on the steering knuckle. As shown in Fig. 3, the machine is set up to grind two diameters on the spindle of the knuckle in one operation, as well as to grind the shoulder of the large diameter. The material is a steel forging and the amount of stock removed is about 0.025 in. This is also finished with a tolerance

Fig. 3 — Grinding bearing mounting surfaces of knuckle spindle in semi-automatic machine



of 0.0005 in. The wheels used are of 30 and 29 in. diameters respectively, and are both 46 DN. The work speed in this case is 825 r.p.m. and the production is 180 complete knuckles per hour.

Fig. 4 shows a Norton full-automatic grinding machine set up with a turret for grinding valve stem guides (Fig. 5). These are of cast iron and are finished at the rate of six to eight per minute roughing, and nine to eleven per minute finishing. In the rough grinding about 0.040 in. stock is removed, and in the finish grinding, 0.004-0.006 in. The wheel in this case runs at 6500 s. ft. per min. and the speed of the work is 800 r.p.m. Four hundred parts are finished for each truing of the wheel, a 20 by 3 by 12 in. wheel, 40/3 L, being used. These parts were formerly ground in a Norton plain grinding machine at the rate of about 150 per hour.

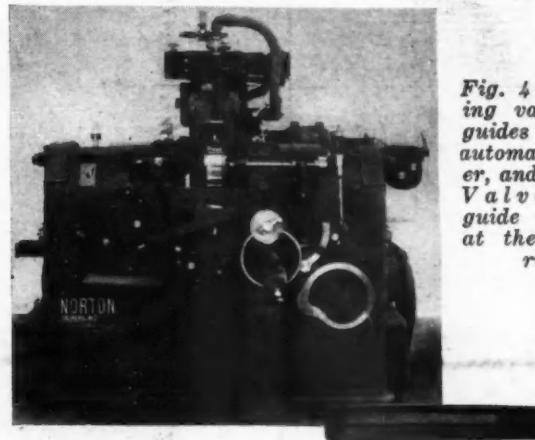


Fig. 4 — Grinding valve stem guides in full-automatic grinder, and Fig. 5—Valve stem guide is shown at the lower right

Budd Expands Abroad Through Who Desire to Learn

AMERICAN experience, plus foreign management, plus American and foreign capital, is the formula upon which is based the European activities of the Edward G. Budd Manufacturing Co., Philadelphia. With factories in Cowley, England, and in Berlin Johannisthal, Germany, and with a license arrangement with Andre Citroen, the American body and body parts manufacturing concern has demonstrated the soundness of this formula by making its extensive foreign properties earn profits.

More than 5000 men are employed in the British and German factories of the Philadelphia manufacturer, where 650 bodies and hundreds of body parts can be turned out every day. Among the European car manufacturers who are using these foreign-built Budd bodies and parts are Morris Motors, Ltd., Wolseley Motors, the Hillman Motor Car Co., Austin Motor Car Co. of England, Adler, N.S.U., Fiat, Horch, Steyr, Wanderer, N.A.G., Dixi, and the Bavarian Motors Works of

Foreign interests with which this to represent as great an in as that of any other Amer

Germany. They are among the leading producers.

Budd's study of European automobile trends began in 1920 when executives of the Philadelphia concern concluded that the post-war depression would be of shorter duration than that following any previous conflict in history. These officials had seen speeding up of production before the war and sensed the impending growth in automobile activity all over the world, especially in America and Europe.

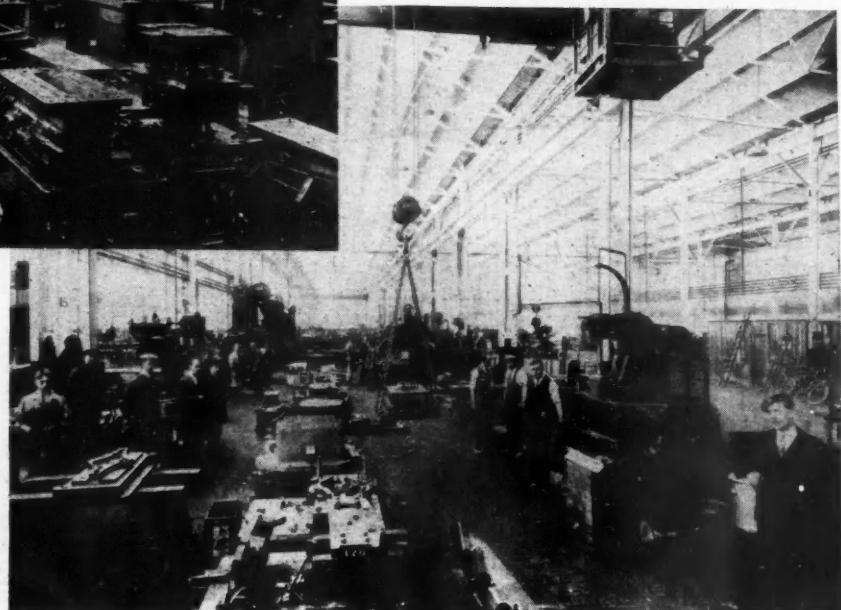
Three years later, their study began to bear fruit when Andre Citroen arranged to use Budd steel body patents and processes on a license basis. During 1923 and 1924, Budd engineers helped M. Citroen to build and arrange his body stamping shops in Paris, and since then have aided him in keeping his operations up-to-date in the development of stamping and metal body construction, basing this consultant work upon the experience of American production.

Citroen's output in automobiles is greater than that of any manufacturer outside of the United States. His production for 1929 is expected to be more than 125,000 cars, an unheard-of figure



Above is a section of the press shop, showing some of the machinery for making all-steel bodies and parts in Ambi-Budd Presswerke, Johannisthal, Berlin, Germany

To the right is a view in the machine shop of the Pressed Steel Co. of Great Britain



Cooperation With Manufacturers American Methods and Processes

*concern is associated are said
vestment in money overseas
ican automotive group.*

for a foreign car manufacturer. To facilitate his production, M. Citroen has followed the example of American manufacturers and has established assembly plants in other centers of population—Brussels, Cologne, Warsaw, Milan, Barcelona, and Slough, near London.

This experience with Andre Citroen convinced the management of the Budd Manufacturing Co. that participation in foreign manufacturing would bring good returns on capital invested. After further study, this concern organized the Pressed Steel Co. of Great Britain, Ltd., at Cowley, about 60 miles from London. This company has been operating since Jan. 1, 1927, and is now employing over 2000 men. The plant has a capacity of 400 bodies a day and the same number of pressed steel chassis parts. Negotiations are now under way which will use this capacity.

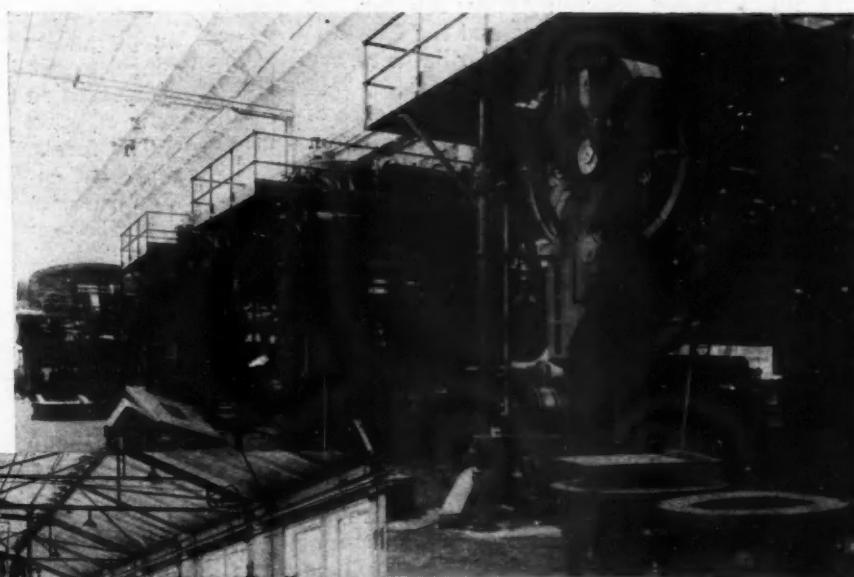
This plant is already engaged in making body and other parts for the Ford cars which will be built in England as a result of the Ford Co.'s creation of a manufacturing plant in England, now being constructed.

To manufacture all-steel bodies to compete favorably with those built in this country and to use British material exclusively, Budd engineers at the Cowley plant found it necessary to give technical assistance to British steel mills and other suppliers of ma-



Edward, Prince of Wales, watching an operation in making chassis frames in the plant of the Pressed Steel Co. of Great Britain, Cowley-Oxon

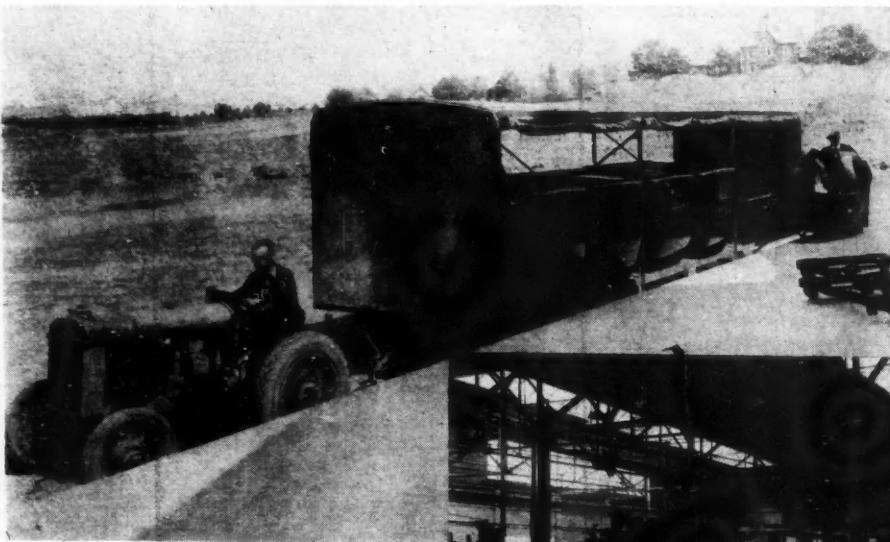
terials to bring everything that went into the job up to the requirements of modern body-building practice. For instance, there was no British-made lacquer that was considered suitable for Budd body requirements, so a subsidiary company was formed. A complete lacquer, enamel and varnish plant was built which, after one year of operation, is supplying other manufacturers with these materials besides providing an adequate source for the parent plant. British material and labor



*View of the battery of presses (above)
in the works of the Pressed Steel Co.
of Great Britain, at Cowley-Oxon,
near London.*



*At left—Budd all-steel bodies being
built in Germany in the Ambi-Budd
plant, Berlin-Johannisthal*



At the left is pictured a tractor hauling Budd bodies from the British factory to the nearby plant of Morris Motors, Ltd.



Below is a view of the Budd all-steel bodies nearing the end of the "line" at Ambi-Budd Presswerke, near Berlin, Germany

are employed in all of these subsidiary activities.

It is reported that the Pressed Steel Co. of Great Britain is definitely over its "growing pains" and is considered by the Philadelphia company as an interesting example of what can be done by American interests in Europe to develop European automobile manufacture.

In the same year the Ambi-Budd Presswerke G.m.b.H. was established with a plant in Berlin-Johannisthal, a suburb of Berlin. It is a partnership organized between Arthur Mueller, head of the Ambi enterprises in Germany, and the Edward G. Budd Co. Besides supplying German car builders, some of the requirements of General Motors, Chrysler, Willys-Overland and Graham-Paige are being taken care of by this concern and just lately it has started working on some of the requirements for Ford's expansion in Europe.

The Ambi-Budd Presswerke was incorporated in 1926 with a paid-in capital of \$1,750,000. Its present assets total more than \$6,000,000. Production was started in the summer of 1927 and now the plant employs approximately 2200 men. It has a capacity of 250 complete bodies daily. It is estimated that the 1929 shipments of the Ambi-Budd Co. will be in the neighborhood of \$10,000,000.

Many central European countries have placed a prohibitive duty on complete automobile bodies, and have put a lower rate on body parts, in order to develop their local body industries and to foster the economic growth of their countries. As a consequence, Ambi-Budd is supplying body builders throughout Europe with all-steel body units which are assembled by local motor car body builders.

The German plant is located on the site of the world's first airport, which was used later by the German army for building airplanes during the World War. The buildings now are occupied by German and American manufacturers and automobile assembly plants. Thirty miles of railroad siding are available and the development includes elaborate company-owned docks, cranes and warehousing facilities along the canals leading to many important points in Europe. The Bush Terminal idea has been used by the Ambi-Budd concern to facilitate shipping at this plant.

A new company usually passes through two years or so of only moderate progress while it is getting its experience. The Budd company bridged this period by supplying its subsidiaries with American-trained personnel to get them started, which actually placed these companies on a profit-earning basis during the first full year of operation.

The foreign interests with which Budd is associated represent as great an investment in money as any foreign investments of any other American automotive manufacturer or group.

English Motor Roller

A NEW type of automotive machine—a motor roller with a small gasoline engine inside of it—is described in *Engineering of London*. It is made in two sizes of about 2000 and 1200 lb., by Wm. Knott & Son, Ltd., of Manchester. The larger roller has a steel shell 33 in. in diameter and 35 in. in width. The shell is made of rolled steel $\frac{3}{8}$ in. thick, and cast iron end plates are bolted to it. The engine, transmission and driving gear are all mounted on a base plate suspended from the axle. A $3\frac{1}{2}$ hp. two-stroke engine is used and drives through a worm gear and friction wheels.

The friction wheels are controlled by means of a rocking grip on the handle; when the latter is turned in one direction it applies power for forward motion, whereas when turned in the opposite direction it applies power for reverse motion. The only other control device is a throttle lever, also mounted on the roller handle, by means of which the speed of the roller can be varied between $\frac{1}{2}$ and 3 m.p.h.

Automobile Sales in New Zealand May Total 23,000 Units in 1929

American passenger cars composed 83 per cent of imports there in the past two years. General business conditions are favorable for an increase in the Dominion.

By JAY BARRY

THE vital question of the day in New Zealand is transportation. The American automobile is surely a great help in solving this question. The New Zealand Government is thoroughly alive to the importance of motor transportation in the development of the country, and the Prime Minister, the Hon. Sir Joseph Ward, has picked a special Board to study every angle of highway development, coordination of rail and motor transportation, traffic problems, safety-first plans, etc.

The findings of this Board will, it is believed, do much to further the substantial steps that already have been taken. Road building and improvement of existing roads during the next few months is definitely on the program. This program has been adopted in lieu of that which the former government had to expand its railways to the outlying districts. Under the present plan the accessibility of the larger city will be made available to the residents of the smaller towns by means of good roads. This, no doubt, will result in an increasing number of passenger cars and truck sales.

New Zealand has nearly 75,000 miles of roads open to the motor traffic. Approximately 50,000 miles are in splendid shape and the new program will develop the remaining 25,000 to such an extent that New Zealand will have a highway system that is equal to that of many larger countries.

Automotive conditions are better than they have been in five years. The entire buying power of New Zealand depends on the prosperity of its butter and cheese crop and its wool clip. This season just passed has been a banner one from both a production standpoint and from high prices being realized. It



View of Lambton Quay, Wellington, New Zealand

being the second good year in succession that the farmers there enjoyed, the spirit of cautiousness that was so in evidence last year has been abandoned to a large extent and the farmer is buying motor cars and commercial vehicles more freely.

From present indications the sale of passenger cars in 1929 should total very close to 20,000 units and commercial vehicles will exceed 3000 units. In 1928 there were 16,680 passenger cars registered as compared with 12,998 in 1927. The American imports in both years were 83 per cent of the total. It is interesting to note that the only really appreciable gain made by any British car was that made by the Austin. In 1927 there were 656 Austins registered, accounting for 5½ per cent of the total passenger car registration. In 1928 there were 1308 Austins registered, accounting for 7.7 per cent of the total cars registered or more than half of the entire British registration. This is not such a serious condition for American manufacturers as it would appear at the first glance, for it is believed that more than 75 per cent of the Austins sold in both years were of the

"Baby" type. This little model is reputed to be landed to dealers in New Zealand at the f.o.b. London price. The New Zealand retail price is in the vicinity of £178 or \$900. It is not plain to the industry as a whole how the Austin factory can be making any money on their small model. It is believed that this price is being quoted so as to get the name Austin well to the fore. If so, it is a successful campaign that they are waging.

Two other British car manufacturers, the Morris and the Clyno, have in the



Modern transportation is used by the ancient Maori tribe in Rotorara, New Zealand



An industrial tractor used on the Wellington, New Zealand, wharves

past few months placed their baby models on the market. Enough time has not yet elapsed to forecast with what success they will meet. It is thought that should an American car manufacturer come out with a small model that it would enjoy big sales in New Zealand. Gasoline costs 54 cents an imperial gallon there and if a baby car can get 40 to 50 miles per gallon it is a big selling point in its favor.

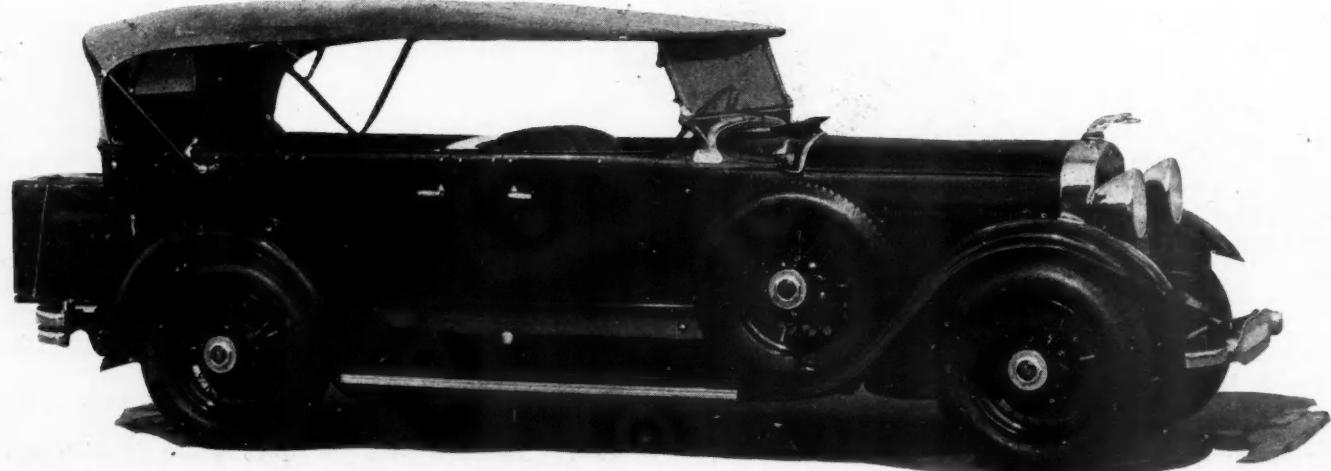
Well over 50 per cent of the total sales made in New Zealand are in cars retailing at less than \$1,500 there. It must be remembered that all factors included, the total duty on an American car valued at less than \$1,500 comes to over 56 per cent. Then there is long haul of 6000 miles from the base, fairly high freight and landing charges, etc. When the car is retailed in New Zealand it usually is sold in the vicinity of 100 per cent more than the American user would have to pay.

The habit of granting excessive trade-in values on used cars is being discontinued to a large degree. The trade-in values were so high for a year or two that although a number of dealers were selling many cars, they were not really making any money. The fallacy of their practice is generally realized by all the dealers now and is having a wholesome effect.

Second-hand car stock is low. Dealers are not making the effort that they formerly did to rid themselves of their new cars and stock up heavily with trade-ins. It is the rule now to get a limited amount of second-hand cars on hand and then not to make any more trade-ins until some of the used cars have been sold.

With the continued prosperity has come a spirit of confidence, optimism and general belief that 1929 will be one of the best from a dealer's point of view that the New Zealand trade has known.

New Lincoln Touring Car



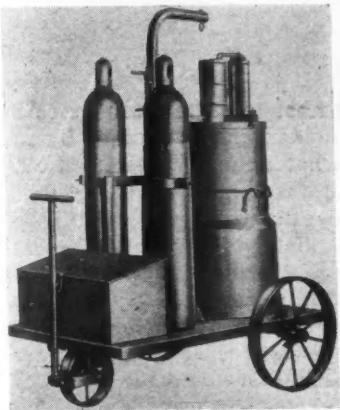
View of the new Lincoln body type, which, with auxiliary seats in the rear, has seating capacity of eight persons. It is priced at \$4,650

New Automotive Developments

Carbic Generator Trucks

THE Oxfeld Acetylene Co., 30 E. Forty-second Street, New York City, has recently introduced two new types of trucks to accommodate Type CLP-3 and Type CLP-2 carbic low-pressure acetylene generators, respectively.

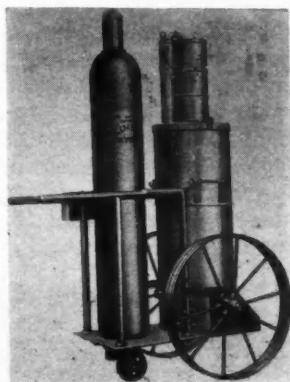
The truck designed to carry a CLP-3 carbic generator



Truck for Model CLP-3 carbic generator

The truck is provided with fastenings. This box can be used for wrenches, small tools, or for a welding or cutting outfit. The oxygen cylinders are chained to a steel rack which is fastened to the deck of the truck beside the generator. A crane is provided to be used in charging and emptying the generator. The crane jib is made in three sections which can be telescoped when not in use to decrease the height. The truck has two 24-in. steel wheels with 3-in. tires, and a castor wheel which is 12 in. in diameter by 2 in. All wheels are provided with grease cups for lubrication.

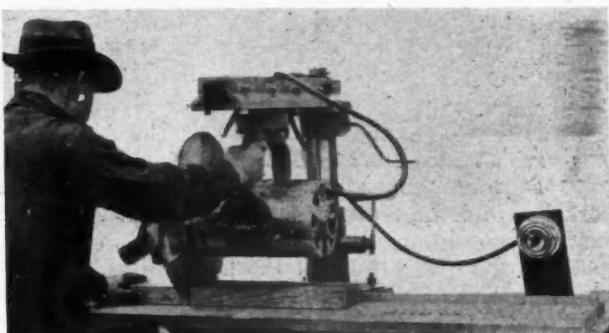
The smaller truck will accommodate one cylinder of oxygen in addition to the Type CLP-2 carbic generator. It is designed for extreme portability and can be wheeled anywhere with ease. There are two 24-in. steel wheels and one 5-in. castor wheel operating on a roller bearing. All wheels are provided with grease cups for lubrication.



Truck for Model CLP-2 carbic generator

machine is ripping, cross-cutting, dadoing, mitering, beveling or performing any other of twenty-nine operations for which it is adapted.

This new model is equipped with a two or three-phase alternating current motor of 5 hp. It is capable of giving more power at full load than the motor formerly used, and shows less temperature rise. As examples of



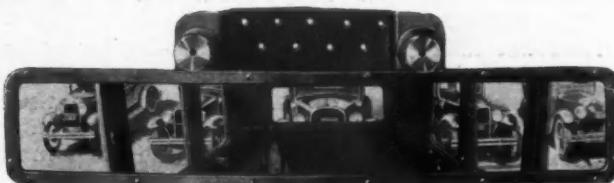
Improved Model D Wonder-Worker

the working capacity of the machine the manufacturers mention that it rips 4-in. fir at the rate of 50 ft. per min., cross-cuts 6-in. material, and can be switched instantly from cross-cutting to ripping without shutting off the power. The cutting tool is completely guarded in all positions.

Another improvement in this model is the location of the dial plate with degree markings and pitch scale right out in front of the operator for easy adjustment for angle or bevel cutting. The dial plate is notched at each 45 deg. for the quick finding of such angles. The motor can be quickly locked in any cutting position by means of a positive locking device and convenient hand lever.

Simplex Rear-View Mirror

A NEW panoramic rear-view mirror which gives the driver of a car a full view of the road behind has been added to the line of products of the Simplex Piston Ring Company of America, Inc., Cleveland, Ohio. The Simplex rear-view mirror, as it is called, enables the driver to look out of all of the windows of the car at the same time. A valuable feature of the Simplex mirror is that, since the glass diffuses light in all directions, it obviates the blinding glare from the headlights of cars to the rear.



Simplex rear-view mirror, giving panoramic view of road behind

De Walt Wonder-Worker

IMPROVEMENTS made in the Model D Wonder-Worker of the De Walt Products Corp., Leola, Pa., are said to have increased by 50 per cent the amount of power which can be delivered to the tools, whether the

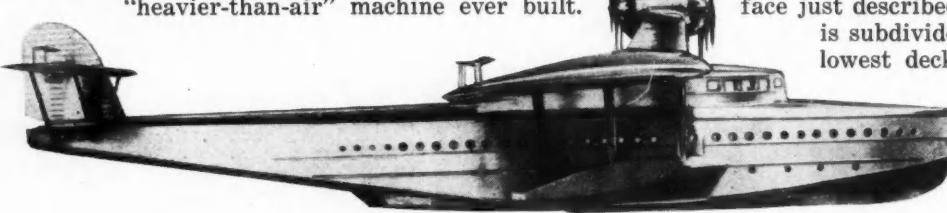
Dornier Flying-Boat is Largest Having Twelve Air-Cooled Engines

Powerplants of the ship are accessible in flight from a gangway in the wing beneath them. The plane is capable of carrying one hundred passengers with baggage.

By EDWIN P. A. HEINZE

AFTER two years of work upon it, the Aktiengesellschaft fuer Dornier Flugzeuge has completed its Dornier "super-flying ship" in specially built workshops on the Swiss side of Lake Constance. The company was organized expressly to build this ship, and a site on the Swiss shore of the lake (which forms the border between Switzerland and Germany) was chosen because it was most convenient.

The new ship, which is capable of carrying 100 passengers with baggage, is by far the largest "heavier-than-air" machine ever built.



View of the Dornier flying ship, capable of carrying 100 persons, which its designer believes typifies the giant craft of the future

It is known as the DO X model, and is essentially a much-enlarged copy of the very successful Dornier Super Whale. Dr. Dornier, who demonstrated his first flying boat as far back as 1917, has since devoted his entire effort to this type of machine, and has been very consistent in its development.

The DO X is a monoplane with wings of the high-lift section fastened laterally to the top of the hull. Though built on the cantilever principle, each wing is connected by three slanting steel struts to the combined stub wings and floats projecting from the lower part of the hull beneath the wings. These stub wings are a characteristic feature of Dornier flying boats, and give not only great lateral stability on the water, but also act as gliding surfaces and help to lift the hull from the water when starting. Wings and hull are built of duralumin throughout. The wings have a span of 157.4 ft., with straight and parallel leading and trailing edges, and no lateral dihedral. They have a total area of 5300 sq. ft., and their tips are rounded.

No fewer than 12 air-cooled Siemens-Jupiter engines of the nine-cylinder radial type, having a total maximum output of 6300 hp., are installed in six engine nacelles above the wings. Each nacelle has one engine in front with a "tractor screw," and the other in the rear with a propeller. The nacelles are supported on streamlined funnels, which give access to the engines from a gangway in the wing beneath them, so the en-

gines and their control members can be attended to by the crew during flight. The nacelles are joined by and form an integral part of what may be termed an auxiliary wing with corrugated duralumin sheathing.

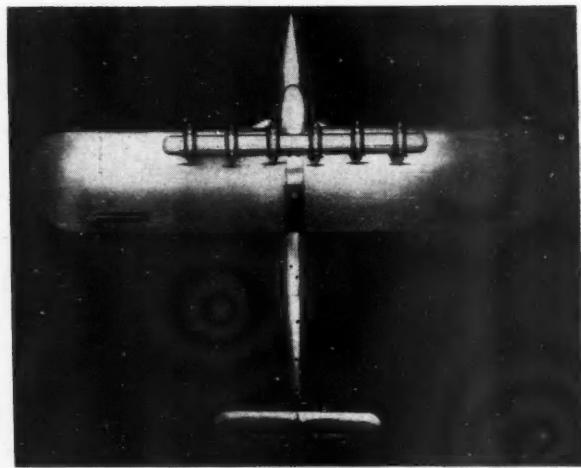
The hull, with a total length of 131.4 ft., has a flat gliding bottom for approximately 40 per cent of its length, where there is a step merging into a short keel with a rudder, the rest of the bottom also being flat.

At the sharp bow the bottom has a shallow V form, which gradually merges into the flat gliding surface just described. The hull has three decks and is subdivided by numerous bulkheads. The lowest deck contains the fuel tanks, spare

parts, tools, loose navigation equipment, stores, etc. Its head room is such that a full-grown man can stand upright in it. The middle deck is the main one, and is reserved for the passengers. It is nowhere

less than 7.2 ft. high, except at the rear end, where the kitchen, sleeping quarters for the crew, etc., are arranged. The room allotted exclusively to the passengers has a length of 66 ft. and a width of 19.6 ft. The equipment and furnishing of this deck will be varied to suit individual requirements.

This reservation of the intermediate deck to the passengers insures that the crew can do its work without coming in contact with or being impeded by them. The



Top view of the Dornier seaplane, showing the arrangement of the twelve engines in six nacelles on the upper wing

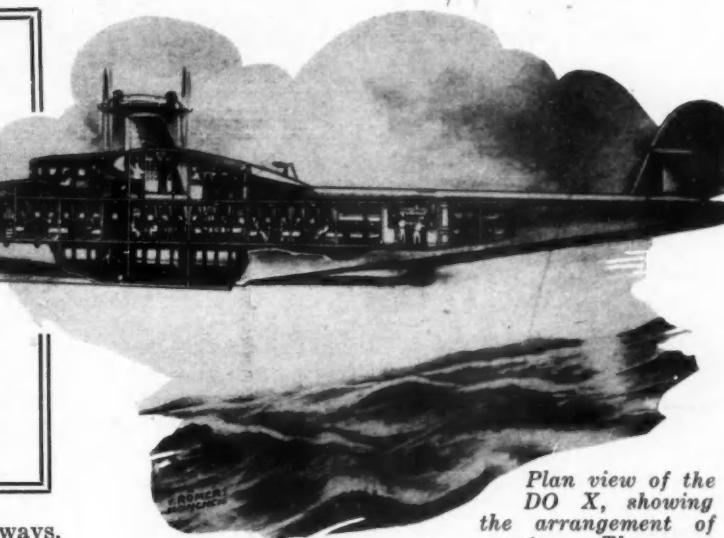
Heavier-than-Air Craft Built,

ON the first flight of the Dornier seaplane, the ship flew over Lake Constance, Switzerland, with 17 persons, including Dr. Dornier, for more than three hours. Another test was made in which twenty-five persons were carried, bringing the total weight of the plane to 81,760 lb. This final test included a trial flight with only eight of the twelve engines in operation, the ship taking off from the water within 28 seconds, or two seconds less than the time required in the original trial with twelve engines running.

While attaining a height of approximately 1970 ft. over Lake Constance, the DO X developed a speed of about 131 m.p.h. (210 kilometers), and later, with engines throttled down, a speed of 180 kilometers, or about 112.5 m.p.h. Engines, controls and instruments functioned perfectly during the tests and the landings were made smoothly.

top deck, which also gives access to the wing gangways, is reserved entirely to the crew. In front it constitutes a large cabin with bay windows, and it is subdivided into several compartments. The foremost one is the pilot's room. Immediately behind this is the commander's and captain's room. Next is a room housing the control instruments, gages, thermometers, revolution counters, etc., of the engines. This is occupied by an engineer and a staff of four mechanics. The last is the wireless room. The engineer's room also contains a small motor coupled to a generator producing current for the ship's lighting and the numerous auxiliary machines.

Fully laden the ship weighs 50 tons, but half of this may be pay load. This is by far the most significant fact in connection with this ship. Dr. Dornier claims that—contrary to what has been the general opinion up to the present—with increasing dimensions flying boats become proportionately economical and that a doubling of the size of a boat may mean a far greater expansion in the pay load. The DO X is designed to travel a distance of 600 miles without stopping and with a pay load of no less than 10 tons, that is, 100 passengers with



Plan view of the DO X, showing the arrangement of quarters. The upper deck is partitioned off into the pilot house, engine control room and radio room. The main deck is for passenger accommodations and crew's quarters. The lower deck contains the fuel tanks.

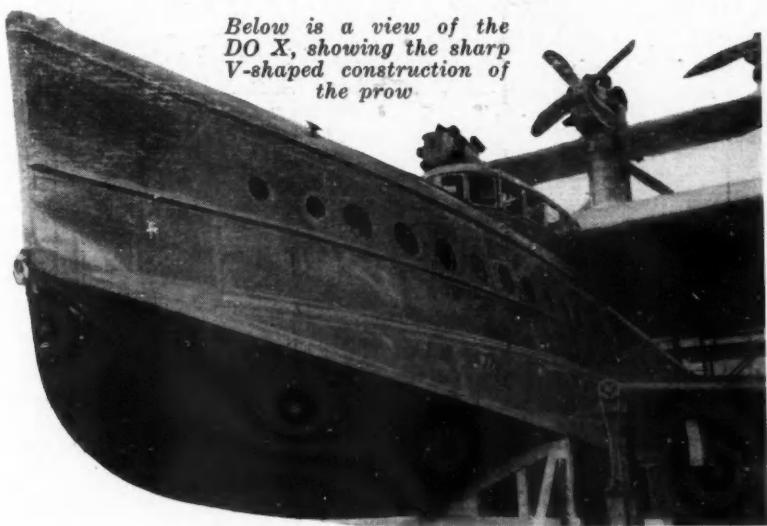
ample luggage, fuel for 6 to 8 hours' flying, and the necessary crew. The maximum speed of the ship is calculated to be 150 m.p.h., while the average cruising speed will be about 120 m.p.h.

The new ship is claimed to represent an important advance with respect to the safety of passengers in overseas flights. Reference has been made already to the accessibility of the engines, which may be reached during flight from gangways below the nacelles. In these gangways the fuel feed lines, cables and control connections to the engines are installed, so that they may be under constant surveillance. The large number of engines is a factor of safety in itself, for if one of the 12 should go "dead," that would mean only a decrease of 8 per cent in the total power, and this can be easily made up by the rest. Dr. Dornier states that four and even five of the engines might stop during flight without preventing the ship from remaining in the air and maintaining its altitude.

Safety is also enhanced by division of the work of pilotage among several individuals. In a small ship the pilot must fly, observe the ground, read charts and instruments and sometimes operate the wireless set as well. In a ship of the size of the DO X, one person more or less is of no great moment, and the functions of control may therefore be readily divided to the extent indicated when describing the pilot's quarters. With a further view to maximum safety the fuel tanks are placed at a distance from the engines.

Aircraft experts will watch with interest the behavior of this new giant air liner in the air and also on a rough sea. The flat bottom of the boat is a handicap from the viewpoint of navigation on rough seas, but has an advantage in facilitating the take-off.

Below is a view of the DO X, showing the sharp V-shaped construction of the prow.



First with
the News

Reliable,
Accurate

News of the Industry

PAGE 170

VOLUME 61

Philadelphia, Saturday, August 3, 1929

NUMBER 5

Expect August Production Will Exceed July Figure

PHILADELPHIA, Aug. 1—Although final figures covering July production in the automobile industry as a whole will not be available for several days, it is generally believed that aggregate production for the month just closed will show greater activity than was recorded for July, 1928. Production during August is expected to exceed that of July because of increased production schedules contemplated by several companies that are preparing to introduce new models. Leaders of the industry in Detroit report that the long sustained demand for cars in the field continues favorable, allowing, of course, for normal seasonal decline.

The recent improvement in the agricultural outlook throughout the country, it is considered, will be a highly favorable influence on the automobile market during the next several months.

Experts in automobile merchandising think that the changed position of the American farmer will result in a wider outlet of automobiles and commercial vehicles, especially in the medium and low-priced classes.

It is believed that July production for the entire automobile industry will show a recession from June. At present, however, it appears doubtful that production during any of the re-

(Continued on page 172)

Packard Standard Eight Models Are Reduced \$290

DETROIT, Aug. 1—Price reductions of \$290 have been announced by the Packard Motor Car Co. on all Standard Eight Models, effective Aug. 1.

These reductions have been made because the company expects to announce new cars in the fall. Although they will be the same in size and of characteristic Packard appearance, they will have enough changes to classify them as new models.

8-26

Sedan	\$1,985
Coupe	2,060
Convertible coupe	2,135

8-33

Runabout	\$2,085
Phaeton	2,085
Touring	2,185
Coupe	2,285
Club sedan	2,285
Sedan	2,285
Sedan limousine	2,385



A. J. Brandt
consulting engineer, who has been
elected president of the American
Austin Car Co.

Motor Wheel Earnings Up

NEW YORK, July 30—Motor Wheel Corp. and subsidiaries report a net profit for the first half of 1929, after all charges, of \$2,432,998. This is equivalent to \$3.54 a share, and compares with \$1,331,574, or \$2.42 a share for the same period last year. Earnings for the second quarter are \$1,331,195, or \$1.94 a share, as compared with \$769,929, or \$1.40 a share for the corresponding quarter a year ago.

Brandt Heads New American Austin

Initial Financing is Over-subscribed; Production Plans Withheld

NEW YORK, Aug. 1—American Austin Car Co., recently organized to produce the Austin seven horsepower car at Butler, Pa., for sale in this country, this week floated an issue of 250,000 shares of its authorized 1,000,000 shares of common stock for initial financing at \$12.50 a share. This issue was immediately oversubscribed. The company is also floating an issue of 225,000 shares in England this week, at a comparable price.

A. J. Brandt, formerly vice-president of Oakland Motor Car Co., in charge of production, and more recently consultant for Autocar, is president of the new American company. Other officers are not yet announced. Mr. Brandt has just recently returned from Russia where he studied the situation for the Soviet government with a view to establishing government plants there for the production of cars in that country.

Plans are going ahead for the production of cars at the Butler plant and equipment and machinery are being purchased for that purpose, it is understood.

Mr. Brandt, who has offices in Detroit, refused to give names of other officers of the company or indicate plans for producing the proposed automobile.

English Austin Sales Decline

WASHINGTON, Aug. 1—Reporting at a meeting of the Austin Co., Ltd., held at London on June 11, Sir Herbert Austin stated that the company's balance sheet covering the last 15-month period was disappointing in some respect, according to Department of Commerce this week.

The buoyant tone which pervaded the market in October, 1927, was followed by a very lean period lasting over several months, the company having prepared after consultation with its agents for a largely increased program of manufacture and sales, found itself with a large stock of cars, necessitating the curtailment of production and the discharge of a considerable number of employees, he stated.

Chevrolet Offers Two New Models

Imperial Sedan and Sport Coupe in Line Now

DETROIT, Aug. 3—Chevrolet Motor Co. today announces two new closed body models, the Imperial sedan and the sport coupe, listing at \$695 and \$645 respectively, f.o.b. factory, Flint, Mich.

The introduction of these two models comes simultaneously with the announcement that more than 950,000 six-cylinder cars have been delivered into the hands of owners and that Chevrolet factories are operating on the biggest summer production level in the history of the company.

Production of the new models has been under way for several weeks and several thousand of the new cars have been shipped to dealers, it is announced.

As a result of these two additions, Chevrolet passenger car line embraces seven cars—five closed and two open models.

Wright Earns \$2.25 a Share

NEW YORK, July 30—Wright Aeronautical Corp. reports net earnings for the first six months of the current year of \$1,354,497 after all charges. This is equivalent to \$2.25 a share on the 600,000 shares outstanding, and compares with earnings of \$1,092,875, or \$3.64 a share on the 300,000 shares outstanding for the first half of last year. Earnings for the second quarter were \$820,572, or \$1.36 a share, as compared with \$621,978, or \$2.07 a share for stock outstanding at the close of the corresponding quarter a year ago. The company shipped 1300 engines during the first half of this year, as compared with 658 during the first half of 1928. Shipments during the second quarter were 618, as compared with 382 a year ago.

Japan Curb Hurts Market

WASHINGTON, Aug. 1—The decision of the Japanese Government to curb official purchases has adversely affected the automotive market in Japan, says a cable from Tokio to the Department of Commerce received here this week. Although the passenger car market is very dull, it is expected that sales for the first half of this year will show an increase over those for the same period of last year, the cable adds.

Crude Rubber Inactive

NEW YORK, July 29—Trading on the Rubber Exchange last week was fairly quiet, according to F. R. Henderson Corporation, and prices fluctuated through a comparatively narrow range. Stocks of crude rubber on hand in British Malaya as of June 30 are estimated at 23,236 tons on the estates, and

15,514 tons in the hands of dealers. This compares with 21,846 tons on the estates, and 13,211 in the hands of dealers, as of May 31. Stocks in London were increased last week to 30,790 tons. Arrivals at all ports of the United States for the first 26 days of July are estimated at 35,000 tons.

Fight For Land Recovery Holds Up G.M.C. Building

SAN JUAN, PORTO RICO, July 28—Pending a new battle by the U. S. government to recover from Lieut. Commander Virgil Baker, U. S. N., retired, a 12-acre tract including the old Spanish fort, San Geronimo, General Motors Co. has stopped work on its proposed \$150,000 building on the disputed property. Commander Baker, who holds a 999-year lease on the land from the United States government, subleased a part of it to the automobile company. According to Representative Frank James, Michigan, chairman of the House Military Affairs Committee, who is making a tour through here, Congress will be asked to authorize the army to recover the leasehold by purchase or condemnation, for the national defense. In a recent suit the government lost its case before the Supreme Court, in which it charged fraud and misrepresentation on the part of the former naval official in acquiring the lease.

Wolverine Screw Earnings

DETROIT, Aug. 1—Wolverine Screw Co. reports earnings for the first half of 1929 of \$89,569 net after all charges including Federal tax. This is equivalent to about \$1.20 a share on the 75,000 shares of common stock outstanding.

Studebaker Earns \$2.47 Per Share

Second Half Nets \$4.81 a Share, as Against \$4.44 a Share

NEW YORK, July 30—Second quarter earnings of the Studebaker Corp. were reported \$4,852,686 after all charges, including income taxes, equal to \$2.47 a share on the 1,912,687 shares of common stock outstanding at the end of the period. This compares with earnings of \$2.39 a share for the 1,875,000 shares outstanding for the same quarter of 1928.

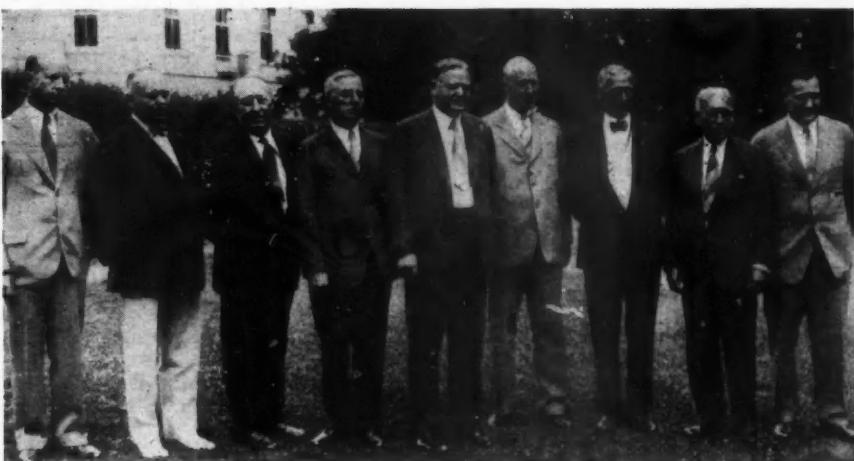
Net profit for the first half of the year, the company reports, are \$4.81 a share, as compared with \$4.44 a share for the same period last year. These profits do not include Studebaker's equity in Pierce-Arrow Motor Car Co. net profits, which were 55 cents on each Studebaker common share, which would make Studebaker's earnings for the first half of 1929 total \$5.36 a share.

Net sales for the second quarter amounted to \$40,242,511 on 31,180 cars and for the first half year were \$77,981,426 on 61,208 cars.

In the second quarter of 1928 sales totaled 40,594 cars with a value of \$46,494,091, and for the first six months of last year amounted to 75,284 units with a total value of \$85,148,407.

The consolidated balance sheet as of June 30, last, shows current assets of \$47,728,759, as against current liabilities of \$12,851,968, leaving a net working capital of \$34,876,791, an increase of \$2,273,730 compared with Dec. 31.

American Delegates to Pan-American Highway Congress



Just before sailing for Rio de Janeiro, bid President Hoover farewell at the White House. Left to right: Pyke Johnson, Highway Education Board; Thomas H. MacDonald, chief of the U. S. Bureau of Public Roads and chairman of the Highway Education Board; Representative Cyrenus Cole of Iowa; J. Walter Drake, Highway Education Board; President Hoover; Senator Tasker L. Oddie of Nevada; Frederic A. Reimer, president of the American Road Builders Association; H. H. Rice, treasurer, National Automobile Chamber of Commerce, and Frank T. Sheetz, chief highway engineer of Illinois

August Production Will Exceed July, Is Outlook

(Continued from page 170)
 maining months in 1929 will fall below that reported for the corresponding months of last year.

Reports on sales for July from several of the leading centers and the outlook in these areas follow:

New York

Continued demand for low-priced cars keeps the total volume of sales in the New York market above that for the corresponding month last year. Over 30 per cent of the new car registration has been accounted for by Ford and Chevrolet, with Ford maintaining its lead over Chevrolet. New registrations continue to run about 20 per cent ahead of last year, but this is not distributed as widely among the different lines as it was a year ago. Dealers who handle the line of manufacturers covering a wide range, report that their higher priced models are suffering now to the advantage of the lower priced lines. Not all the higher priced cars are showing weakness, some of them showing marked leads over previous sales. There has been a tendency toward the accumulation of stocks in many lines, but this has not yet reached proportions where it is causing much disturbance in the market. Continued conservatism in trading has prevented the used car situation from becoming as disastrous as it has been in certain past periods. Lines that are bringing out new models along about this time, report that they are in the cleanest condition in which they have ever found themselves for the introduction of new models.

New car registrations for the first week of July, the only figures as yet available, were 5857, according to Sherlock & Arnold. This compares with 4795 for the corresponding week of last year and with 4357 for the first week of June this year.

Philadelphia

Sales of new cars for the month of July exceeded the figures for July of last year, but the demand was chiefly for cars in the class below a \$1,500 wholesale price, with Ford in advance of Chevrolet. Sales in the higher price bracket, with the exception of Packard, continue to move slowly, even in the face of sharp price cutting. Used car stocks are higher than they have been for the previous two months.

Columbus

Registration of all classes of motor vehicles in Ohio during the first six months of 1929 totaled 1,625,006, according to a report issued by Chalmers R. Wilson, head of the Ohio department of motor vehicle registration. This total is divided as follows: 1,418,793 passenger cars; 168,842 trucks, 10,895 passenger commercial cars; 5558 motorcycles; 1480 side cars; 15,560 trailers, and 3786 dealers and manufacturers. The total registration on June 30 this year was within 86,000 of the total registration for 1928, which totaled 1,711,215. Commissioner Chalmers R. Wilson estimates that the registration this year will exceed 1,800,000.

Chicago

New car sales in the Chicago territory for July continued at practically the same level as in June and showed about the same increase over July of last year as did the previous month over last June. Used car

sales seem to have accelerated materially, probably 20 per cent greater than in June. Used car stocks have decreased in the same proportion during the month. No overloading of dealers, new car stocks is apparent in the territory with one or two minor exceptions. Fords continue to lead all other makes in the number sold and the entire lower price bracket field continue to sell about 75 per cent of the total retail output so far as units are concerned.

Detroit

New car sales in July dropped considerably from the high total of 15,864 recorded for June. While final figures are not yet available, it is indicated that the total sales for the month just closed will reveal a decrease from the corresponding month in 1928 for the first time this year. Sales in July, 1928, totaled 9335 cars, and indications are that the July, 1929, figure will hardly exceed 50 per cent of that total. Prompt deliveries in practically all models are available now. New car stocks are fairly heavy, but this situation is not considered alarming. Stocks of used cars continue at high levels, although the market for this class of merchandise is considered favorable. Dealers attribute the present comparatively low levels in new car sales to the high volume of sales recorded for the first six months of the current year when 77,687 new cars were disposed of, as compared with 42,671 in the corresponding period of 1928. The outlook for August sales appears none too promising.

Cleveland

Trade conditions in this territory for the past month have been marked with a slow but steady increase in new car movement, but an exceptionally abrupt falling off in used car sales. Optimism among dealers that the peak of seasonal slackness in sales had been passed now is tempered with the depression in the second-hand market. While exact figures were not obtainable, all indications point to a record somewhat lower than that set in June. As usual Ford sales led the field.

New Orleans

Ford sales eight per cent less than last month, due to inability to fill orders. Chevrolet sales five per cent less. All other makes two per cent less. Very healthy demand created for used cars by trolley strike. Continued rains and unsettled business blamed for poor month. All dealers confident of much better business for August. Ford leads sales with 317, Chevrolet 207, all others 406.

Cincinnati

New and used car sales increases for July over the same month last year are approximately 30 and 16 per cent, respectively. July new car sales fell off 14.7 per cent, compared with June and used cars 6 per cent. New car stocks 16 per cent under June, but used car inventories about 10 per cent greater. Compared with July last year, new and used car stocks are about 38 and 16 per cent lower, respectively. Low-priced cars accounted for 72.7 per cent of June sales; medium, 23 per cent and high-priced, 4.3 per cent. Ford sales were 126 per cent greater than Chevrolet and 510 per cent above Essex, next in line. Weather is good and August outlook satis-

factory. Used cars causing some dealers worry, but generally inventories are in good shape.

Seattle

Retail car sales in Seattle territory for July show an increase of approximately 10 per cent over sales for June and an increase of at least 25 per cent over sales for July, 1928. With weather conditions now favorable, and with sales in all makes of cars running ahead, dealers anticipate third-quarter this year will show definite gain over 1928. Ford still outdistancing all competitors in number of sales, with ample stocks available. Used car market is good, with dealers getting good prices, although slightly under prices obtained last year at this time. In view of definite pick-up in sales, prospects look very good for August. Dealers' stocks of all cars ahead of last year.

Oakland

Northern California sales for July about 10 per cent greater than one year ago and nearly 10 per cent greater than June, 1929, due principally to increased Ford sales. Ford, with a total of approximately 3000 sales, has nearly 500 more than in June. Ford sales more than twice those of Chevrolet in July and these two approximately equal to sales of all other makes combined. Stocks of new and used cars relative to sales about same as last month and year ago except Ford dealers optimistic for equal or greater sales in August. Buick's new model greatly stimulated orders. They expect record month.

Boston

Dealers are entering the last five months with more cheerfulness, due to the even sales during July. The tendency to curve downward was not so pronounced. An exceptional period of fair weather, particularly over the weekends, aided salesmen to make demonstrations day after day, resulting in orders. Organizations are being kept up to high pitch. New car stocks are being depleted, and used cars are reaching a safer margin, in both cases dropping about 15 per cent from June. Waiting for new car announcements have not slowed sales this year of other lines, and have aided those bringing out new models. Ford is thousands of orders behind and his totals show a big gain that is reflected in sales of other small cars. In other classes the percentage of sales have been fair compared to big production.

St. Louis

New car sales during July were below normal with the result that stocks are heavy. The month's sales were about 8 per cent less than July last year. Low-priced cars outsold the higher priced models and Ford enjoyed a sales advantage of about 30 per cent over other low-priced models. Used car sales and stocks are normal.

Dallas

Automobile sales in this district show no sign of abatement. With a \$75,000,000 grain crop on the market, a \$30,000,000 fruit, tomato, vegetable and melon crop practically sold, and a \$475,000,000 cotton crop in the offing, the outlook for the next few months is brighter than those of the past when a new record was established. Actual new car sales 3 per cent above July and 12 per cent above same month a year ago. Fords and Chevrolets running

neck and neck with Whippets. Essex and Durants hold their own. Medium-priced cars normal. Good increase in rural business. Used car sales about same as for July. Dealer stocks new cars seasonal. Used cars heavy, due to some long allowances on trades. Accessories, parts, tires and truck sales about same as for July. Outlook for all lines bright. Little possibility of dealers getting overstocked on low-priced cars.

Atlanta

New car stocks are gaining on sales in the Atlanta district, volume in July reported off compared with earlier months except higher-priced cars which continued active. Low and medium priced cars about same as last year, high-priced cars better. Stocks on hand also about the same as last season, including all prices. Ford sales are reported holding up fairly well, and running in excess of Chevrolet. The August outlook is not considered very promising, but dealers look for active fall demand, due to excellent crop yields in the Southeast this year and high prices prevailing. The used-car situation is very bad, stocks the largest they ever have been and sacrifice prices prevailing.

Minneapolis

While automobile sales, wholesale and retail, have slowed up as much as 25 per cent compared with June, they are 25 per cent ahead of last year and for the first seven months of the year an estimate of increase over the period for last year is as high as 50 per cent. Warm weather and some scare as to the crops as well as impending announcement of new models have cut down business. A decline is normal at this period here. Stocks and sales preserve a good balance with no large stocking up. Low priced cars continue to dominate the market, Ford leading the Chevrolet, although the high-priced car market holds up well. The used car market is in fair condition with some of the agencies in better cleanup than last year. The best dealers stand for a value trade-in for used cars. The situation is better than last year.

Milwaukee

Except for a slightly lagging movement of the medium-priced cars, which is largely relative, Milwaukee dealers are entering August with good prospects for continued active business. Stocks of passenger cars are generally reported as favorable, despite heavy factory shipments, the movement into customers' hands having been good and above a year ago every month so far this year. New car registrations since Jan. 1 show an increase of about 40 per cent, not entirely due to the excellent showing Ford is making. Chevrolet sales are holding up well and have a moderate lead over last year. The high-priced cars continue to do exceptionally well. The general business situation is good, with employment experiencing less than the usual summer decline. This is favoring the used car market and relieving some of the stress occasioned by the large influx of used cars growing out of the active demand for new cars. In the fight for business some dealers have been getting away from the tendency of recent months to pare down trade-in allowances to the bone, but the used car situation as a whole presents no greater problem than has been the rule. There is no good reason apparent why August volume should not be large and again in excess of last year.

Denver

Trade conditions in Denver and vicinity continue unsatisfactory; below this month last year, and about the same as June, 1929. Throughout the state the farmers are still

**Six Enter Airplanes
in Guggenheim Event**

NEW YORK, July 29—Six new entries to the International Safe Aircraft Competition sponsored by the Daniel Guggenheim Fund for Promotion of Aeronautics have been announced by Harry F. Guggenheim, president. They are the Cosmic Aircraft Corp., the Cunningham-Hall Aircraft Corp., the Dare Airplane Co., the Fleet Aircraft, Inc., and the Pitcairn-Cierva Autogyro Co. of America.

Two British entries, Vickers, Ltd., and DeHaviland Aircraft Co., Ltd., have been forced to withdraw on account of the extreme pressure of work in connection with British Government contracts.

helpless under last year's poor crops and poor prices, and just now are threatened by drought which has already ruined a great deal of spring wheat. Even the irrigated districts are short of water, but later crops are being benefited by recent rains. Stocks continue high and sales low. Probably 10 to 20 per cent higher in stocks than last year, and about 20 per cent lower in sales. The decline seems about the same on high-priced and medium-priced cars, with more satisfactory reports from low-priced ones. Ford sales continue from 3½ to 4 to 1 on Chevrolets, and about twice that on Whippets, the next contender. Many people, of course, are waiting for the new models before buying. Used car stocks continue abnormally high, and the situation appears to be out of the dealers' control. Consequently there has been a very marked drop in price on used cars. In spite of the above situation there is a feeling that August will show a marked improvement.

Kansas City

Automobile sales here in July were about 20 per cent better than in June with probably a slight increase over a year ago. Stocks in hands of dealers normal to low with only a scattering of dealers being overloaded. Dealers have been pushing used car sales to bring stocks to normal. This condition has had its effect on new car sales to some extent. Ford sales continue to lead the field. Chevrolet second with De Soto a new contender for third place.

Los Angeles

Sales in this district for the past month are slightly ahead of the corresponding month last year with the greatest improvement noted in the lower price class. Medium and the higher price groups show little variation from July, 1928. The chief cause of the gain in the lower price bracket is the result of Ford gains largely, that make approximately equaling in sales the total of the two closest competitors. Used car stocks have been a greater problem this summer despite strenuous efforts to move them by sales and efforts to make a more attractive buy by more thorough reconditioning. For August dealers are anticipating a renewed sales activity with the release of buyers who have been waiting to see the midseason new models.

**Steel is Healthy
as Prices Hold Up**

**Black Sheets Drop, However,
and Price Strategy
is Rumored**

NEW YORK, Aug. 1—While the steel market enters upon the fag-end of the summer in much better shape than it usually does, backlogs are showing the effect of excess of production over fresh commitments. Prices are well maintained, except for black sheets and minor concessions in cold-rolled strip steel.

There has been some talk in the last few days that if black sheet prices continued to wilt and undermine the generally steady tone of the market, the usual remedy for such a state of affairs would be applied in the form of an announcement of higher fourth-quarter prices, which stratagem, if history repeats itself, should furnish a prop for going prices and in addition bring out commitments that are being held in abeyance.

The market for No. 24 gage, box annealed one-pass cold-rolled sheets is generally quoted at 2.85 cents, Pittsburgh, but automotive buyers are buying sheets for finishing and not strictly one-pass, on a 2.75 cents basis.

Heavy gage blue annealed sheets, coming under the classification of light plates, are more or less irregular in price. Full-finished automobile sheets continue firm, and while there is no indication so far that finishing mills are booking much new model business, they have a sufficient quota of orders to maintain operations at a good rate. Demand for both hot and cold-rolled strip steel is rather spotty. Aside from a willingness to apply large lot prices to smaller orders for cold-rolled strip, mills generally show resistance to demands for price concessions.

Fresh commitments for automotive alloy steels are largely in abeyance. Automotive demand for wire products is light. Routine conditions prevail in the market for bolts and nuts.

Pig Iron—Third-quarter buying is somewhat more active, but there are still quite a few foundries drawing on second-quarter contracts which were carried over into the current quarter. The market remains steady, the Michigan quotation being \$20, Lake furnace. The Valley price continues at \$18.50 for No. 2 foundry and \$19 for malleable.

Aluminum—Shipments from the American producer's Canadian plant reached record proportions in June, totaling 13,531,000 lb. The previous high was 11,154,200 lb. in July, 1927. Shipments in June of this year exceeded the total shipments during the preceding four months. Of the 13,531,000 lb. exported, 8,752,100 lb. came to the United States. The market remains quiet and steady.

Copper—Preparations for heavier consumption are indicated by the increased takings of copper by the fabricating subsidiaries of the leading producers.

Diesel Research Group is Formed

Manufacturers to Study Simplified Practices and Design

NEW YORK, Aug. 1—Leading manufacturers of Diesel engines in the United States have formed the Diesel Engine Manufacturers' Association, and have appointed a research engineer to study and report on simplified practices.

Members of the association are the New London Ship & Engine Co., Groton, Conn.; Worthington Pump & Machinery Corp., New York; Fulton Iron Works Co., St. Louis; Ingersoll-Rand Co., New York; Fairbanks, Morse & Co., Chicago; Nordberg Mfg. Co., Milwaukee; I. P. Morris & De La Vergne, Philadelphia; Winton Engine Co., Cleveland; Cooper-Bessemer Corp., Mt. Vernon, Ohio; McIntosh & Seymour Corp.; Busch Sulzer Bros.; Diesel Engine Co., and Hooven-Owens-Rentzschler Co.

Officers are Henry L. Sutphen, president of Electric Boat Co., president; E. T. Fishwick, Worthington Pump & Machinery Corp., vice-president, and Harlan A. Pratt, Ingersoll-Rand Co., secretary and treasurer. M. J. Reed is research engineer of the association.

Moto-Meter Assets Are Reported at \$5,649,735

NEW YORK, July 30—The consolidated statement of the recently organized Moto-Meter Gauge & Equipment Corp., as of Dec. 31, 1928, filed with the New York Stock Exchange, shows total assets of \$5,649,735, and a capital stock and surplus represented by 512,500 shares no par common stock, of \$4,323,522. Current assets are listed at \$3,597,253, as against current liabilities of \$832,682.

R. G. Martin, formerly president of the Safe-T-Stat Co., was elected president of Moto-Meter at its organization meeting here last week. Victor C. Bell was elected chairman of the board of directors. This company is a merger of the Moto-Meter Co., Safe-T-Stat Co., and National Gauge & Equipment Co., together with the subsidiaries.

Cirrus Using Wills Plant

NEW YORK, July 30—American Cirrus Engines, Inc., is equipping the former Wills-St. Claire Automobile Co. plant at Marysville, Mich., for machining crankcases. The plant at Belleville, N. J., is keyed up to produce 50 engines per day, but is being retarded by inability to get finished crankcases.

Oversize Tires Cut Costs

WASHINGTON, Aug. 1—The use of oversize tires, which can be run at considerably less than their usual load, will result in reduced expenses per mile

and fewer interruptions in service, says a circular published this week by the Bureau of Standards. Satisfactory performance can sometimes be obtained from second-grade tires by running them under light loads, the letter points out. The increasing use of 6 and 8-ply balloon tires is mentioned, and for heavy service such tires are recommended.

Casings Shipments Show Increase in First Half

WASHINGTON, Aug. 1—Exports of truck and bus casings, 6 in. and over, for the first six months of 1929 numbered 153,007, having a total value of \$4,247,476, says a report issued this week by the rubber division of the Department of Commerce.

Inner tubes for automobiles exported during the same period numbered 1,050,958 and had a total value of \$1,911,357. Denmark, Spain, Czechoslovakia, and Argentina were the best markets for 6-in. casings, and Argentina, Cuba, Belgium, Brazil, Denmark and the Philippines were the best markets for inner tubes.

Dodge Cuts Bus Prices

DETROIT, July 30—Price reductions from \$50 to \$220 have been announced on its present line of school buses by Dodge Bros., and two new models of longer wheelbase and 40 per cent greater carrying capacity have been added.

The 983, one of the new types announced, is mounted on a 140 in. wheelbase chassis and has a carrying capacity of from 25 to 31 children, and the other new bus is mounted on a 165 in. wheelbase and has a capacity of 31 to 40 children.

The former 165 in. wheelbase school bus has both a smaller carrying capacity, and a \$10 higher price. Following are the price reductions effected on the other models.

Model	Capacity	Reduction
885		\$220
886	53	200
883	18 to 23	50
884	22 to 29	70

General Motors Shows Taxi

NEW YORK, July 29—General Motors Truck Co. is exhibiting at 211 West 61st St., a new taxicab model 010 equipped with radio. This cab is of the town car type with the passenger compartment completely enclosed.

Standard Gets Order for 10 Planes

NEW YORK, July 29—New Standard Aircraft Corp. has received an order from Colonial Flying, Inc., for 10 five-place open cockpit planes.

Japanese Making Laminated Glass

WASHINGTON, Aug. 1—The Department of Commerce announced this week that a special laminated safety glass, composed of two sheets of glass with a thin sheet of celluloid, is now being manufactured in Japan.

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for AUTOMOTIVE INDUSTRIES.

NEW YORK, Aug. 1—Adverse conditions in the leading wheat-growing areas of the world have caused considerable fluctuation in prices, but the general trend is upward. Industry and trade continue at very satisfactory levels, and current reports of iron and steel production are very favorable.

LUMBER PRODUCTION

Lumber production is running ahead of new business, according to the National Lumber Manufacturers Association. Lumber orders reported for the week ended July 20 by 554 softwood mills totaled 331,819,000 ft. or seven per cent less than the production of the same mills during that period.

CRUDE OIL PRODUCTION

Average daily crude oil production for the week ended July 20 amounted to 2,893,950 bbl., as compared with 2,891,750 bbl. for the week before and 2,401,850 bbl. for the corresponding week last year.

COAL PRODUCTION

Production of bituminous coal during the week ended July 14 amounted to 9,442,000 tons, as compared with 8,610,000 tons in the corresponding week last year. Production of Pennsylvania anthracite during the week ended July 14 amounted to 1,068,000 tons, as against 1,112,000 tons a year ago.

CAR LOADINGS

Railway freight loadings for the week ended July 13 totaled 1,064,632 cars, which marks an increase of 39,707 cars over those in the corresponding week last year and an increase of 47,238 cars over those in the corresponding week two years ago.

FISHER'S INDEX

Professor Fisher's index of wholesale commodity prices for the week ended July 27 stood at 99.2, as against 98.8 the week before and 98.1 two weeks before.

BANK DEBITS

Bank debits to individual accounts outside of New York City for the week ended July 24 were 23 per cent above those in the corresponding week last year.

FEDERAL RESERVE STATEMENT

The consolidated statement of the Federal Reserve banks for the week ended July 24 showed increases of \$1,200,000 in holdings of bills bought in the open market and of \$4,800,000 in member bank reserve deposits. There were decreases of \$19,700,000 in holdings of discounted bills and of \$7,400,000 in holdings of government securities. The Reserve ratio on July 24 was 74.7 per cent as compared with 73.8 a week earlier.

Produces New Flexible Shaft

NEW YORK, July 31—Consolidated Instrument Co. of America has produced, for use in tachometers for aircraft, marine and industrial use, a new flexible shaft called the Allbronze shaft.

Ford Inaugurates Shipment by Ocean

Regular Schedule Will Operate From East to Pacific Plants

CHESTER, PA., Aug. 1—Beginning of regular scheduled shipments by water of parts from the Ford assembly plant here to similar plants on the Pacific Coast, will be marked by the sailing of the "Lake Benbow," a Ford fleet ship of 3000-ton burden, now loading at the pier of the Chester plant. The "Lake Benbow" is expected to clear from Chester at the completion of the loading, which it is estimated by Ford officials, will take two or three additional days.

Enough parts for the assembly of approximately 7000 completed units will go with the initial shipment, which is consigned to Ford plants in Los Angeles, San Francisco and Seattle. The "Lake Benbow" will sail through the Panama Canal, and on reaching the west coast, call at the ports serving these assembly plants in the order named. About 35 days will be required to complete the trip from clearing at Chester, to unloading at Seattle.

On its return from Seattle the "Lake Benbow" will probably take on a cargo of lumber for an eastern port, and after discharging this, return to Chester for another consignment of parts for Pacific Coast assembly plants.

Parts for such shipment are sent by rail from the Rouge plants of the Ford Motor Co., and transferred directly to the ships at the Ford piers in Chester, which accommodate two ships at a time for loading. Eventually, it is expected that four or five ships will be regularly engaged in shipments of parts to west coast plants.

Exports to India Stronger

WASHINGTON, Aug. 1—American cars have strengthened their position in the Indian market at the expense of foreign makes, particularly Fiat, says a cable received by the Department of Commerce this week from Calcutta. The monsoon has been responsible for a slight decline in registrations, although the number of cars registered is more than 20 per cent above the number for the same period of last year. Economic conditions have affected the used car purchaser and the problem of disposing of used cars is presenting some difficulty, says the cable.

Malay Car Sales Dull

WASHINGTON, Aug. 1—with sales dull throughout Malaya, stocks of light Canadian cars are heavy, American cars normal and British cars light, according to a cable received this week by the Department of Commerce from Singapore, S. S. Stocks of British cars are light, says the cable, in anticipation of new

models which are expected to arrive in September. The used car problem is causing considerable concern in the Singapore district, the report states.

Bendix Earns \$2.57 Per Share During First Half

NEW YORK, July 30—Bendix Aviation Corp. reports net earnings for the six months ended June 30 of \$5,165,968, or \$2.57 a share on outstanding stock. These earnings do not include those of the Pioneer Instrument Co. which was acquired the latter part of June.

In a separate statement, Charles H. Colvin, general manager of Pioneer, said that that company grossed a larger return during the first quarter of the current year than during the first five months of 1928, while March shipments were 30 per cent more than any previous month in the company's history. He estimates that gross sales for 1929 will total \$1,400,000 as compared with \$940,000 for 1928.

Federal Truck Earnings More

DETROIT, July 30—Federal Motor Truck Co. reports for six months ended June 30, 1929, net profits of \$315,771 after depreciation, interest and federal taxes, equivalent to 63 cents a share on 499,543 no par shares of stock. This compares with \$214,203 or 45 cents a share on 475,473 shares of stock in first half of 1928.

Unit Corp. Builds Addition

MILWAUKEE, July 30—Contracts have been let by the Unit Corp. of America for the construction of a one-story shop building, 100 by 225 ft., for the use of the Universal Power Shovel Co., a Detroit manufacturing concern, recently acquired. The new shop will cost about \$100,000 with complete equipment, according to W. H. Schmidt, president. The Unit Corp. manufactures a complete line of transmission units for the automotive industries.

Glancy Extends Foundry

WAUKESHA, WIS., July 30—The Glancy Malleable Iron Corp. has broken ground for a foundry extension, 118 by 208 ft., and as this nears completion work will be started on the enlargement of the shipping room with a new unit, 120 by 240 ft., according to A. R. Glancy, Detroit, president.

G. E. Develops New Indicator

NEW YORK, July 31—General Electric Co. has developed a new temperature indicator designed for aircraft engines in laboratory and general use. This device is a cold-junction, temperature compensated instrument, consisting of a thermocouple with its leads and a remote indicating instrument calibrated to read engine heat. When mounted in the cylinder heads and walls of aircraft engines, it will indicate engine temperatures at any desired remote point.

Duty Will Remain As Is, Couzens Says

Countervailing Clause to be Dropped, is Belief

WASHINGTON, Aug. 1—Breaking the rule of secrecy which has surrounded deliberations of Republican members of the Senate Finance Committee, Senator Couzens, Michigan, this week was quoted in Washington newspapers as declaring that the Republican group had decided to retain the present duty of 25 per cent ad valorem on automobiles and trucks in the Hawley-Smoot tariff bill but strike out the countervailing provision.

The present law provides for a duty of 25 per cent ad valorem on automobiles and trucks with a countervailing proviso and the House bill makes no change in this rate.

The effect of the removal of the countervailing provision, it is said, will be to substantially reduce the average tariff of about 32 per cent ad valorem to 25 per cent.

In making known the result of deliberations of his Republican colleagues on the committee, Senator Couzens is credited in the newspapers with stating that inasmuch as there have been disclosures in the past he feels at liberty to inform his constituents of the action of the committee.

Recently, leaders in the automotive industry appeared before a subcommittee of the Senate Finance Committee and suggested a reduction of the duty on passenger cars from 25 to 10 per cent ad valorem and the retention of the countervailing clause. They asked that the present rate of 25 per cent be retained on trucks, together with the countervailing proviso.

Rains Hit Philippine Sales

WASHINGTON, Aug. 1—The rainy season and poor prices received for Philippine exportable products contributed to the downward course of the Philippine market during June, according to a cable received this week by the Department of Commerce from Manila. Dealers are reporting poor business in all classes of passenger cars, while truck sales are good for this time of the year.

Giddings & Lewis Add Shop

FOND DU LAC, WIS., July 30—The Giddings & Lewis Machine Tool Co., manufacturing horizontal drilling, milling and boring machines exclusively, is building a shop addition, 90 by 225 ft., to be used for assembling and erecting.

Reports Order for Tungtite Rings

HAGERSTOWN, IND., July 29—The Hupp Motor Car Co., has just placed a large order with the Perfect Circle Co. for the new Tungtite compression rings.

Men of the Industry and What They Are Doing

Whalen is Appointed to Managership of Fokker

W. T. Whalen, who has been associated with General Motors Corp. since 1920, has been appointed vice-president and general manager of the Fokker Aircraft Corp. of America, according to announcement made by James A. Talbot, chairman of the board. Mr. Whalen joined General Motors in 1920 as a branch manager of the United Motors Service Corp. In 1922 he joined the Export company in charge of factory relations at Oshawa, Ont. Since that time he has served as manager of the Far Eastern division, managing director of General Motors Continental at Antwerp, and vice-president and general manager of General Motors Export Co.

Sparks on State Air Board

Capt. William Sparks, president and general manager of the Sparks-Withington Co., Jackson, manufacturers of radios, has been appointed a member of the Michigan state board of aeronautics. He fills the vacancy caused by the resignation of Capt. Edward V. Rickenbacker, who was transferred from the Cadillac-LaSalle division of General Motors Corp. to the Fokker Aircraft Corp. with headquarters in New York. The board met recently, unofficially, to elect William B. Mayo, chief engineer of the Ford Motor Co., chairman, and Claude Carney of Kalamazoo, vice-chairman.

Fox Joins Houde

Merritt L. Fox, formerly assistant professor of mechanical engineering, State University of Iowa, has been appointed manager of the research and engineering department of the Houde Engineering Corp., Buffalo. He recently developed a device known as the Gyro-accelerometer, for measuring angular velocity, angular acceleration and total turning angle.

Feiker and Reeves on Committee

Frederick M. Feiker, managing director of Associated Business Papers, Inc., and Alfred Reeves, general manager, National Automobile Chamber of Commerce, have been appointed members of a committee of the Chamber of Commerce of the United States to assist organized and unorganized trade groups and individuals by supplying information on the technique of association work.

Dwyer Joins Autocar

C. Eustace Dwyer has been appointed assistant sales manager in charge of national accounts for the Autocar Co., motor truck manufacturer, Ardmore, Pa.



George H. Bancroft

whose appointment as purchasing agent for Willys-Overland to succeed the late Willard B. Calkins, was announced last week in Automotive Industries

Nash Gift Building Started

Ground has been broken for the new Y.M.C.A. building at Kenosha, Wis., made possible by a gift from Charles W. Nash, president of Nash Motors Co. Mr. and Mrs. Nash offered a gift of \$400,000 on condition that citizens of Kenosha would subscribe a similar sum. The campaign actually produced \$417,000. The cost of the building, with furnishings, is estimated at \$680,000, and the remainder of the building fund will be used for operation and maintenance.

Eckerle Sails on Bremen

John Eckerle, president of Aluminum Industries, Inc., and a close personal friend of Captain Leopold Ziegenbein, master of the S. S. Bremen, was a passenger on the ship's return trip to Europe. Following a tour of Germany, he will visit several other countries in Europe and expects to be abroad about two months.

Frank and Dunn Promoted

Arvid L. Frank has been appointed sales manager of the Studebaker Pierce-Arrow Export Corp., and D. D. Dunn has been named general service manager of the corporation. Mr. Frank has just returned from an extensive trip through Europe.

Henry Ford Is 66 Years Old

Henry Ford celebrated his sixty-sixth birthday at Detroit, Tuesday by working as usual. He visited his birthplace, however, and in the evening visited his friend, Thomas A. Edison.

Dunlap Heads Promotion Work for Durant Motors

Zac Dunlap, former branch manager in the Chicago area, has been named head of the new sales promotion department of Durant Motors, Inc., effective Aug. 1. He organized the National Old Trails coast-to-coast highway in 1912, established state highway departments in 14 Southern States during 1914, and organized the Dixie Highway from Mackinac, Mich., to Miami, Fla., in 1915. He joined Durant in 1925, when he became local distributor in Ames, Iowa, after several years as Ford dealer. Mr. Dunlap will be succeeded in the Chicago post by George Watson, district manager for Durant in Milwaukee.

Holt Heads Kari-Keen Sales

Don Holt, prominent Sioux City business man, has been made sales manager of the Kari-Keen Mfg. Co., auto luggage carrier concern, and several other changes in the personnel have followed election of F. E. Moskovics, New York City, as chairman of the board. Mr. Moskovics was former president of the Stutz Motor Co. and now heads the Improved Products Co., which has an interest in the Iowa firm. Mr. Holt succeeded E. Alden. Dr. B. H. Sprague, Huron, S. D., has been named vice-president.

Olds Adds Two Engineers

Two additions to the Oldsmobile-Viking engineering staff and a slight revision of titles are announced by I. J. Reuter, president and general manager of Olds Motor Works. The new members of the engineering staff are John Oswald and Kenneth Plasterer. The Oldsmobile-Viking engineering staff now is composed of the following executives: John G. Wood, director of engineering, with complete supervision of all engineering activities; C. L. McCuen, chief engineer, in full charge of all engine and chassis design and development; Earl H. Smith, assistant chief engineer; John Oswald, body engineer, with supervision of the art and color section; Kenneth Plasterer, production engineer.

Bieling Promoted by Stutz

Walter Bieling, Stutz district sales manager in the central territory for the past four years, has been appointed district manager for the far west, comprising all states west of the Rocky Mountains, according to announcement made here by Col. E. S. Gorrell, president of the Stutz Motor Car Co. Mr. Bieling was formerly with the Marmon Motor Car Co. and the Lexington Motor Car Co.

May Employment Dropped Slightly

Decreased 1.1 Per Cent From April Figures for Automotive Industry

WASHINGTON, Aug. 1—Employment in the automobile industry decreased 1.1 per cent in May, as compared with April, and payroll totals decreased 3.2 per cent, according to the July issue of the Labor Review made public this week by the Department of Labor.

According to the Review there were 483,327 employees engaged in 217 automobile manufacturing plants during April, and this number decreased to 478,225 in May. Payroll totals amounted to \$17,410,635 in April as against \$16,860,895 in May. Compared with May, 1928, however, the number of employees engaged in the automobile industry in May, 1929, was nearly 17 per cent greater and payroll totals were 18.5 per cent higher.

In the automobile tire industry the number of employees increased from 63,302 in April to 64,271 in May, an increase of 1.5 per cent, while payroll totals increased from \$2,045,168 in April to \$2,058,876 in May, an increase of 7 per cent. There were 15 per cent more men employed in the rubber tire industry last May than in May, 1928, according to the Review.

Show Managers Reelect Officers at Chicago

CHICAGO, July 29—Promotion of attendance at next year's automobile shows and new car bootlegging were among the major topics discussed at the annual convention of the National Association of Automobile Show and Association Managers held July 25 and 26 at the Drake Hotel.

Robert E. Lee, of St. Louis, was re-elected president of the association. Herbert Buckman, of the Cleveland association, and Leon F. Banigan, editor of *Motor World Wholesale*, continue as vice-president and secretary, respectively.

Finger Visits Detroit

DETROIT, July 29—William L. Finger, American automotive trade commissioner to Europe, is making an extended tour of the Middle West, visiting manufacturers in the automotive and aeronautical industries in the interest of American trade relations abroad. Mr. Finger left Detroit last week after a two weeks' visit. He announced that South Bend, Ind., would be his next stop and that a visit to Chicago would follow.

Dayton Increases Capacity

NEW YORK, July 29—Dayton Airplane Engine Co. now has its plant equipped for the production of 10

Dayton Bear 4-in-line air-cooled engines a day, according to R. R. Grant, president. The company has orders on hand to insure capacity production for the next three months.

Borg-Warner Earnings Are \$5.95 for First Half

CHICAGO, July 29—Net earnings of the Borg-Warner Corp. for the first half of 1929 amounted to \$4,554,427 after charges, including depreciation and Federal taxes, the semi-annual statement of the company reveals. This is equal to preferred dividends totaling \$122,500 at \$5.95 a share, on 744,257 shares of \$10 par common stock. The net income for June, after all charges, was \$660,403, or 86 cents a share after allowing for preferred dividend requirements.

While no comparison with the corresponding period of last year is available, George W. Borg, chairman of the board of the corporation, states that the 1929 earnings are well in excess of those of the constituent companies for June, 1928, and the first half of the year.

William P. Hemphill, for many years a vice-president and comptroller of Amar & Co., of Illinois, has been elected a director of the Borg-Warner Corp., succeeding S. L. Ingersal, who resigned.

Ralph DeMarco

MILWAUKEE, July 29—Ralph DeMarco, wholesale representative of Willys-Overland, Inc., in Wisconsin, died at his home in Green Bay, Wis., following a recent operation for appendicitis. He was 30 years of age and until a year ago was a resident of Milwaukee. He was associated with Willys-Overland nearly eight years.

Seeks to Aid South America

WASHINGTON, July 29—The Bureau of the Budget and the Secretary of Agriculture have approved the proposal to detail engineers of the Bureau of Public Roads to assist countries of Central and South America in determining their respective highway programs, contained in the bill introduced in the Senate by Senator Oddie of Nevada, it was learned here this week.

Lower Prices Rumored

ST. LOUIS, MO., July 30—It is rumored that the Windsor 1930 models, to be announced soon, will include a big Six at a price considerably reduced over its predecessor, as well as a dual range of big Eights at new "revolutionary" prices.

Landis Opens Cleveland Office

WAYNESBORO, PA., July 30—The Landis Machine Co., manufacturer of thread cutting machinery, has opened an office in Cleveland in charge of J. T. Benchoff, district manager.

Financial Notes

Bohn Aluminum & Brass Corp. reports for six months ended June 30, 1929, net profit of \$1,781,579 after charges and Federal taxes, equivalent to \$5.08 a share earned on 350,831 no par shares of capital stock. This compares with \$1,644,089 or \$4.70 a share on 350,000 shares outstanding in first six months of 1928. Sales during first half of 1929 totaled \$21,071,880.

Pierce-Arrow Motor Car Corp. declared the regular quarterly dividend of 1½ per cent on the 6 per cent cumulative preferred stock, payable Sept. 1 to stockholders of record Aug. 10. The directors voted to call the balance of \$2,589,200 of 20-year 8 per cent sinking fund gold debenture bonds maturing in 1943, by payment, Sept. 1 next, out of bank balances. With the retirement of these bonds, the company will be completely out of debt with the exception of \$352,000 of first mortgage purchase money notes on its Long Island City property.

Houdaille-Hershey Corp., June 30, 1929, filed a balance sheet with the New York Stock Exchange, showing current assets of \$5,611,930 and current liabilities of \$1,309,579, thus providing the corporation with \$4,302,351 for working capital. Of the total current assets, \$1,740,226 was cash, which was \$430,649 in excess of the total current liabilities. The inventory position of the corporation, as of June 30, was \$1,580,706. Patents and good will were carried at \$1. Ample reserves have been set up for Federal taxes and contingencies. Earned surplus, as of June 30, 1929, was \$1,176,946.

White Motor Co. report net profit for the first six months of the current year after all charges, of \$1,404,575. This is equivalent to \$1.75 a share, and compares with \$1,161,830, or \$1.45 a share for the corresponding period a year ago. The company has declared a regular quarterly dividend of 25 cents a share, payable Sept. 30 to stockholders of record Sept. 12.

Commercial Investment Trust Corp. reports net profits for the first six months of the current year at a new high record of \$4,042,116. This is equivalent after preferred dividend of \$5.59 a share on common stock and compares with earnings of \$2,246,590, or \$4.14 a share on stock outstanding for the corresponding six months of last year.

Sweden Imported 2228 Cars

WASHINGTON, Aug. 1—Sweden imported 2228 automobiles during June, says a cable received at the Department of Commerce this week from Stockholm.

Warner Gear Expands

MUNCIE, IND., July 29—The Warner Gear Co., a branch of the Borg-Warner Co., will soon occupy the 450 by 250-ft. addition being built to its factory.

Burgess-Norton Adds Lines

GENEVA, ILL., July 30—The Burgess-Norton Mfg. Co. is now manufacturing replacement clutch plates and engine valves in addition to piston pins.

National Air Derby, Cleveland, Offers Prizes of \$100,000 For 44 Events

CLEVELAND, OHIO, Aug. 1—The 1929 National Air Races to be held here Aug. 25 to Sept. 2, will offer nine derby races, four from Pacific Coast cities to Cleveland, one from Canada and one from Florida, and 35 closed events, including refueling and non-refueling endurance flights. More than \$100,000 is offered in prizes and many valuable trophies for aviation clubs and pilots have been announced.

The races are sanctioned by the National Aeronautic Association and will be held under the rules of the Federation Aeronautique Internationale. It will include events for civilians, government pilots and women. Several of the contests, however, will be open to men and women.

Long-distance hops will be from Santa Monica, Miami, Portland, Ore., Oakland and another derby will be from some Pacific Coast city, to be chosen by the entrant.

Although details have not been announced, the Canadian Derby, in which planes will leave Montreal and arrive in Cleveland via Buffalo, will be one of the important races of the national event.

Eight thousand dollars and lap prizes are offered in the woman's derby from Santa Monica to Cleveland. Pilots may either fly alone or with a woman who will act as mechanic. No male will be

allowed to fly in this race. Overnight stops have been announced for this event, which is planned to take about a week's time.

The Miami-Miami Beach to Cleveland derby is an event offering \$5,500 in cash prizes and trophies. It is planned as a four-day race, with overnight stops in Jacksonville, Birmingham and Louisville. Open or closed planes, but not cabin type ships, will be entered in this race.

The Portland, Ore., derby will be a five-day race in which \$6,000 and additional lap prizes will be offered. Lap prize money and \$5,000 will be offered in the Oakland-Cleveland race.

More than \$10,000 has been accumulated by the race committee for the non-stop air derby from some Pacific Coast city to Cleveland. Prizes will be \$7,500 and an interested commercial concern has offered an additional \$25,000 for this event.

Included in the 35 closed events will be a contest for breaking the world's solo endurance record, Cleveland to Buffalo efficiency race, pursuit type races for army, navy, marine corps and national guard pilots, parachute jumping contest, non-stop, non-refuel distance race for world's record, dead stick landing contests, Australian pursuit races, and an acrobatic contest.

domestic shipments had increased slightly less than 20 per cent. The firm's new dual balloon "8" tire has been the most important factor in the business record made by the company this year, according to President O'Neil.

Jack Companies Merging

MILWAUKEE, July 29—With the sale of a large block of convertible preferred stock of the Walker Mfg. Co., Racine, Wis., manufacturer of jacks, to the First Wisconsin Co. and associated financial houses of Milwaukee, the consolidation of the Ajax Auto Parts Co., also of Racine, with the Walker company is being effected. The Walker company is generally known as the largest maker of automobile jacks in the world and employs 900 men. The Ajax company specializes in pressed steel jacks. Consolidated net sales last year were \$3,001,504, with net earnings of \$270,921, compared with \$184,123 in 1927. Walker jacks are original equipment for Ford, Chevrolet, Willys-Overland, Oakland, Pontiac, Hudson, Essex, Oldsmobile, Nash, Marmon, Chrysler, Graham-Paige, Packard and other passenger cars. Warren T. Walker is president.

Reports Best Half

AKRON, Aug. 1—An increase of 46 per cent in general export business of the General Tire & Rubber Co., over the same period last year is responsible in a large measure for the company's largest six months' business in its history, during the first part of 1929. The domestic trade also shared in the increase in business volume, domestic shipments being 20 per cent heavier than during the same period in 1928. Because of lower tire prices this year, however, actual cash revenue from

the Department of Commerce last week. Of these planes 48 are in New York, 9 in Illinois, 9 in Ohio, 7 in Missouri, 6 in California, 6 in Idaho, 3 each in Kansas, Michigan and Minnesota, 2 each in Colorado, Florida, Iowa, Massachusetts, Oklahoma, Rhode Island and Texas, and 1 each in Alabama, Connecticut, Mississippi, Nebraska, New Jersey, Pennsylvania, South Dakota, Tennessee, Vermont, Wisconsin and Wyoming.

Eggleson Will Organize Coach Building Company

GRINNELL, IOWA, July 29—J. D. Eggleson, formerly of the International Harvester Co. farm implement department, has acquired the Spaulding Manufacturing Co. plant, and has announced plans for the formation of a million-dollar corporation to manufacture 100-passenger double-deck motor coaches. The plant is reported to have cost \$836,500 and production will start in 90 days, he said, with a force of 700. E. R. Thomas, Chicago, will be in charge of production.

The principal bus type will be built on semi-trailer plan with six, eight and ten wheels. They will be in four sections with smoking room, parlor compartment, open observation platform and chair car, 34 ft. long, seven ft. eight in. wide and 12½ ft. high. Power plants, which are to be connected with the body with ball and socket joint, will be furnished by motor manufacturing companies until production can be started at the Grinnell plant. The new concern will be organized as the Eggleson Compartment Coach Manufacturing Co.

Pierce-Arrow Sales Gain

BUFFALO, July 29—During the second quarter of 1929, Pierce-Arrow, under Studebaker management, continued to show an increase in sales and profits, with sales amounting to \$11,366,691, compared with \$5,862,284, an increase of 94 per cent over the same period of 1928. Net profits after all charges amounted to \$1,288,643, against a loss of \$282,547 for 1928's second quarter. Second quarter profits showed a gain of \$840,111 over the initial three months of the year. Sales for the first half reached \$16,776,108, compared to \$10,210,885 for the initial half of 1928, while earnings for the period totaled \$1,737,175 against a loss of \$642,220 in the first six months of 1928.

Motorcycles Increasing

WASHINGTON, Aug. 1—Popularity of the motorcycle in Czechoslovakia is steadily increasing, the total number registered as of February being approximately 20,000, says a report received at the Department of Commerce this week from Consul Arthur C. Frost at Prague. English makes predominate, with America and Germany sharing second place honors.

U. S. Licenses 119 Planes

WASHINGTON, Aug. 1—One hundred and nineteen new airplanes were licensed by the aeronautics branch of

Exports, Imports and Reimports of the Automotive Industry for June of Current Year,
and Total for Six Months Ending June, 1929

	Month of June				Six Months Ending June			
	1928	1929	Number	Value	1928	Value	Number	Value
Automobiles, parts and accessories	\$43,829,842	\$50,794,838	9	11,981	80	\$248,658,717	93	\$339,159,664
Electric trucks and passenger cars	11,124	7,446,248	49	82,344	80	98,001	93	139,839
Motor trucks and buses except electric (total)	8,482	4,484,451	12,516	10,138,016	58,948	40,864,888	102,782	61,142,784
Up to 1 ton, inclusive	2,420	2,283,199	4,036	3,499,287	45,129	23,381,285	74,885	33,591,885
Over 1 and up to 2½ tons	222	678,598	318	826,998	12,222	13,458,720	26,052	22,697,179
Over 2½ tons					1,597	4,024,883	1,845	4,853,720
PASSENGER CARS								
Passenger cars except electric (total)	36,080	24,568,449	34,106	22,701,312	194,354	140,260,508	219,610	151,398,630
Low price range up to \$1,000	28,706	15,243,601	26,860	13,477,731	152,015	83,793,992	167,903	86,618,197
Medium price range over \$1,000 to \$2,000	6,365	6,905,635	6,251	6,719,321	36,234	41,337,582	45,400	49,556,428
High price range over \$2,000	1,009	2,419,213	995	2,504,260	6,105	15,128,934	6,307	15,224,005
PARTS, ETC.								
Parts except engines and tires . . . . .	..	4,918,660	..	10,810,492	..	29,645,376	..	73,409,548
Automobile parts for assemblies . . . . .	..	4,794,885	..	5,416,849	..	25,088,036	..	39,386,010
Automobile parts for replacement . . . . .	..	972,680	..	724,219	..	4,708,702	..	5,574,104
Automobile accessories . . . . .	..	752,601	..	786,325	..	3,824,126	..	3,864,828
Trailers	58	11,692	148	46,074	350	142,338	525	246,240
Airplanes, seaplanes and other aircraft	7	108,195	53	855,879	86	940,754	199	3,290,949
Parts of airplanes except engines and tires . . . . .	..	107,005	..	207,015	..	527,095	..	1,053,525
BICYCLES, ETC.								
Bicycles	406	11,680	472	12,656	2,604	70,192	2,660	71,990
Motorcycles	1,341	305,361	1,045	238,206	10,438	2,421,420	10,913	2,460,806
Parts, except tires . . . . .	..	123,111	..	74,843	..	731,756	..	598,229
INTERNAL COMBUSTION ENGINES								
Stationary and Portable	28	183,416	34	733,320	320	530,930	449	630,096
Diesel and Semi-Diesel . . . . .	..	..	..	..	..	..	..	..
Other stationary and portable:								
Not over 10 hp.	2,921	257,663	2,567	224,690	17,928	1,555,533	19,512	1,716,620
Over 10 hp.	747	265,120	215	133,308	1,825	744,302	2,501	1,141,385
Automobile engines for:								
Motor trucks and buses	1,061	97,316	1,105	117,305	7,041	730,474	7,007	911,192
Passenger cars	10,571	1,019,623	7,031	731,476	69,891	7,262,732	66,577	6,836,058
Tractors	8	4,446	69	20,788	227	66,592	456	121,675
Aircraft	7	11,851	29	111,827	65	220,367	178	830,282
Accessories . . . . .	..	..	..	..	..	..	..	..
IMPORTS								
Automobiles and chassis (dutiable)	36	91,496	44	116,502	220	546,396	288	641,953
Other vehicles and parts for them . . . . .	..	66,965	..	193,485	..	272,798	..	953,873

Persian Truck Imports Decrease, Cars Increase

WASHINGTON, Aug. 1—The value of trucks shipped to Persia from America increased from \$144,794 to \$322,779 last year, according to a report from Consul Augustin W. Ferrin, Teheran, to the Department of Commerce. The actual number of truck imports, however, decreased from 487 to 441 and the increased value is based upon the fact that the average value per truck imported nearly doubled during the year.

There was a notable rise in American passenger car imports in Persia. During 1928 the total number of cars rose from 310 with a value of \$161,027 to 563 with a value of \$326,630, says the report. The automobile era in Persia began at the close of the World War and there are now 5700 cars registered in this country, of which about 85 per cent are American makes.

Sterling Delivers Gain

MILWAUKEE, July 29—For the first eight months of the fiscal year, beginning Nov. 1, Sterling Motor Truck Co. deliveries have been 55.4 per cent ahead of the corresponding period last year, and approximately 95 per cent as large as in the entire previous fiscal year. June deliveries were 61.6 per cent ahead of June, 1928.

Stewart-Warner Gains

CHICAGO, July 30—Second quarter earnings of the Stewart-Warner Corp. show a net of \$2,474,147, equivalent

to \$2.02 a share, compared with \$2,226,050 or \$1.85 a share in the same period last year. Net profit for the first half of this year totaled \$4,528,371 or \$3.70 a share against \$3,613,334 or \$3.01 a share in the first six months of 1928.

Lakey Production Under Way

DETROIT, July 29—Lakey Foundry & Machine Co., Muskegon, Mich., is now in full production with new equipment functioning smoothly, following manufacturing difficulties experienced earlier in the year, it was reported by reliable sources here today. The company now has scheduled enough orders to keep its plant operating at capacity from now until the end of the calendar year, and officials, consequently, are optimistic about the outlook for the next six months.

Sixes May Lead All Types in Year's Production

DETROIT, Aug. 1—For the first time in the history of the automobile industry, six-cylinder cars promise to lead the field in production this year, according to a survey by the Chevrolet Motor Co. completed today. Up until this year four-cylinder cars ranked first in annual production volume.

Comparative production figures for the first six months of this year are offered in support of the forecast. During this period there were produced approximately 1,900,000 sixes as compared with approximately 1,265,000 fours, an indication of what the total for the year is apt to be.

Ford's Second Millionth Off Rouge Assembly Line

DETROIT, July 29—A new production record for Model "A" Ford cars was reached Wednesday afternoon when engine No. 2,000,000 came off the assembly line at the Rouge plant of the company in Dearborn. The engine was taken to the car assembly line to be assembled in a convertible cabriolet.

The second million Model "A" Ford cars were produced in the period of five months and 20 days. The first Model "A" was assembled Oct. 20, 1927, and the first million was reached on Feb. 4, this year.

Early production of the model "T" Ford car, predecessor of the present car, forms a striking contrast with the efficiency of modern mass production. The first Model "T" was built on October 1, 1908. It was seven years later, Dec. 10, 1915, before the first million had been attained, and 18 months later, June 14, 1917, before the second million was produced.

Oakland Has Model Shop

PONTIAC, MICH., July 30—A fully equipped model service station has been established at the plant of the Oakland Motor Car Co., to serve dealers as a pattern in planning shops of their own. Each week student mechanics are brought from the field for instruction at the factory where they may perform their "laboratory" work.

The shop is designed to meet the needs of the average Oakland-Pontiac dealer, and has a capacity of from 15 to 20 cars a day.

Houdaille-Hershey Earns \$4.06 a Share

DETROIT, July 29—Net earnings of the Houdaille-Hershey Corp. and subsidiaries for the first half of the year, after all charges including provision for Federal taxes were \$2,177,857.27, it was stated today by Claire L. Barnes, president. These earnings do not include the net profits for the same period of one of the company's subsidiaries, which, if added, would increase earnings by approximately \$100,000.

Based on the exchange of all outstanding Class A and Class B shares of General Spring Bumper Corp. for Class A and Class B shares of Houdaille-Hershey, net earnings are equivalent after provision for the Class A dividend to \$4.05 a share on the 469,533 shares of Class B stock. With the addition of the earnings of the subsidiary, the net earnings would be equivalent to \$4.27 a share.

The Houdaille-Hershey corporation has acquired the General Spring Bumper corporation as a subsidiary on an exchange of stock on a share for share basis. Stockholders were recently notified that the plan and agreement are now operative.

Federal Makes Additions

POUGHKEEPSIE, N. Y., July 30—The Federal Bearings Co., Inc., is making an extensive addition to its plant, consisting of a new steel and concrete wing which will increase floor space by over 40,000 sq. ft. The new structure is of the latest design and incorporates every known improvement in heating, ventilating, lighting, etc. Mr. H. A. Schatz, president, announced that the company has acquired land adjoining the present premises, part of

Hungarian Market Likes U. S. Cars

WASHINGTON, Aug. 1—Thirty-two per cent of the total number of 11,997 passenger cars registered in Hungary in 1928 were American and 52 per cent of all new cars sold were of American manufacture, according to a report received by the Department of Commerce this week from H. C. Schuette, assistant trade commissioner for Hungary. Automobiles, says Mr. Schuette, constitute the chief Hungarian import from the United States.

which will be devoted to the construction of a storage building for raw materials.

Allis-Chalmers Earnings Up

NEW YORK, July 29—Allis-Chalmers Mfg. Co. reports a net profit for the six months ended June 30 of \$2,179,088. This is equivalent to \$7.72 a share and compares with \$1,480,007, or \$5.69 a share for the corresponding half year period a year ago. Profits for the second quarter were \$1,165,713, or \$4.07 a share, as compared with \$1,013,375, or \$3.65 a share for the corresponding quarter a year ago.

Places Radiator Order With Perfex

MILWAUKEE, July 29—The Perfex Corp., Milwaukee, Wis., manufacturers of heavy duty radiators, announces the placing of a large production order by the Allis-Chalmers Mfg. Co.

Briggs & Stratton Earnings Are High

MILWAUKEE, July 29—The Briggs & Stratton Co. set a new sales record during the first half of this year, with the result that net earnings, amounting to \$812,000, increased to within \$200,000 of the net for the entire year 1928. Indications are that unfilled orders assure operations at a high rate during the remainder of the year.

Not only is the lock business large, but the company has heavy production of window regulators. A new type of lifter has been developed, being simpler and more profitable, and being suitable as well for steam and electric railroad coaches.

The gasoline engine division of Briggs & Stratton increased its business 74 per cent since Jan. 1, and now constitutes about one-third of the total business. Production has been started on a 3 hp. engine weighing 110 lb. The line is used largely in power lawn mowers, washing machines, pumps, and small powerplants for isolated places.

Province to Improve Roads

WASHINGTON, Aug. 1—The Province of Alberta will spend \$5,238,000 this year on roads, ferries and bridges, according to a report received this week by the Department of Commerce from Trade Commissioner J. Bartlett Richards at Winnipeg. Of this sum \$2,650,000 will represent capital expenditure of which \$1,500,000 will be used for the construction of main highways, the principal of which are the Peace River and Jasper highways. A total of \$541,000 will be spent on maintenance of main highways and the balance will go for ferries, bridges and municipal highway improvements.

Calendar of Coming Events

SHOWS

- Automotive Exhibit, Canadian National Exhibition, Toronto ... Aug. 23-Sept. 7
- Vienna Fair Sept. 1-8
- International Aircraft Exhibit, Coliseum, Chicago Sept. 7-15
- National Machine Tool Builders' Exposition and Congress, Cleveland, Sept. 30-Oct. 4
- Paris, Automobiles Oct. 3-13
- London, Automobiles Oct. 17-26
- Prague, Automobiles Oct. 23-30
- Paris, Motorcycles Oct. 23-Nov. 3
- M.E.A. Show and Convention, Chicago Nov. 4-9
- N.S.P.A. Show and Convention, Detroit Nov. 11-16
- Berlin Auto Salon Nov. 14
- London, Trucks Nov. 7-16
- Paris, Trucks Nov. 14-24
- London, Motorcycles Nov. 30-Dec. 7
- Brussels Auto Salon Dec. 7
- New York National Jan. 4-11
- Chicago National, Coliseum Jan. 25-Feb. 1

CONVENTIONS

- Second Pan-American Congress of Highways, Rio de Janeiro Aug. 16-31
- American Welding Society, Fall Meeting and Exposition, Cleveland Sept. 9-12
- American Institute of Mining and Metallurgical Engineers, Cleveland, Sept. 9-12
- American Society for Steel Treating, Convention and Exposition, Cleveland Sept. 9-13

- American Chemical Society, Fall Meeting, Minneapolis Sept. 9-13
- A.S.M.E.—Iron and Steel Division—National Meeting, Cleveland Sept. 9-13
- Society for Electrical Development, New York City Sept. 13
- Eastern States Exposition, Springfield, Mass. Sept. 15-21
- American Electric Railway Association, Atlantic City Sept. 28-Oct. 4
- National Industrial Advertisers Assn., Cincinnati Sept. 30-Oct. 2
- National Safety Congress, Annual, Chicago Sept. 30-Oct. 4
- Penna. Automotive Association, Erie, Pa. Oct. 7-8
- Permanent International Association of Road Congresses, Sixth Session, Washington, D. C. Oct. 23-25
- Society of Industrial Engineers, Detroit Oct. 16-18
- National Hardware Association, Atlantic City Oct. 21-24
- Society of Industrial Engineers, Sixteenth Annual Meeting, Hotel Statler, Cleveland Oct. 23-25
- Amer. Gear Mfrs. Assn., Phila. Oct. 24-26
- World Engineering Congress, Tokyo, Japan Oct. 29-Nov. 22
- National Automotive Parts Association, Detroit Nov. 6-8
- Highway Research Board, Ninth Annual Meeting, Washington, D. C. Dec. 12-13
- National Automobile Dealers Association, New York City Jan. 6

- American Roadbuilders Association, Atlantic City Jan. 11-18
- National Automotive Dealers Association, Chicago Jan. 27-28

RACES

- British Tourist Trophy Race Aug. 17
- Cleveland Aug. 18
- National Air Races and Show, Cleveland, Aug. 24-Sept. 2
- European Grand Prix, Italy Aug. 31
- Altoona, Pa. Sept. 2
- Schneider Trophy (Aeronautical), Calshot, England Sept. 7
- Syracuse Sept. 8
- Toledo Sept. 15
- Los Angeles Nov. 17

S. A. E.

- Aeronautic Meeting, Cleveland Aug. 26-28
- Production Meeting, Cleveland Oct. 2-4
- Transportation Meeting, Toronto Nov. 12-15
- Annual Meeting, Detroit Jan. 21-24

SALONS

- Hotel Drake, Chicago Nov. 9-16
- Hotel Commodore, New York City Dec. 1-7
- Hotel Biltmore, Los Angeles Feb. 8-15
- Palace Hotel, San Francisco, Feb. 22-Mar. 1